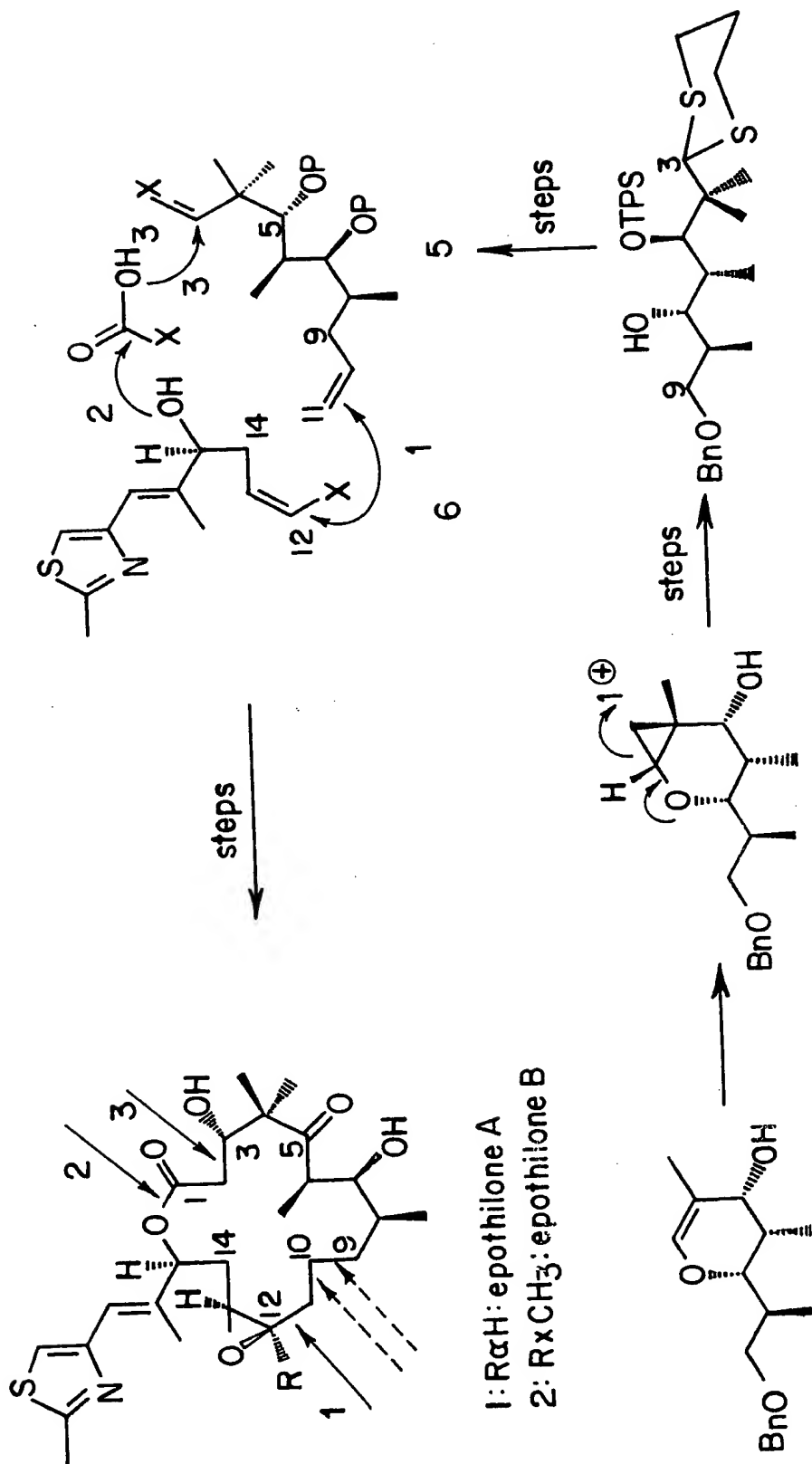


FIG. 1A



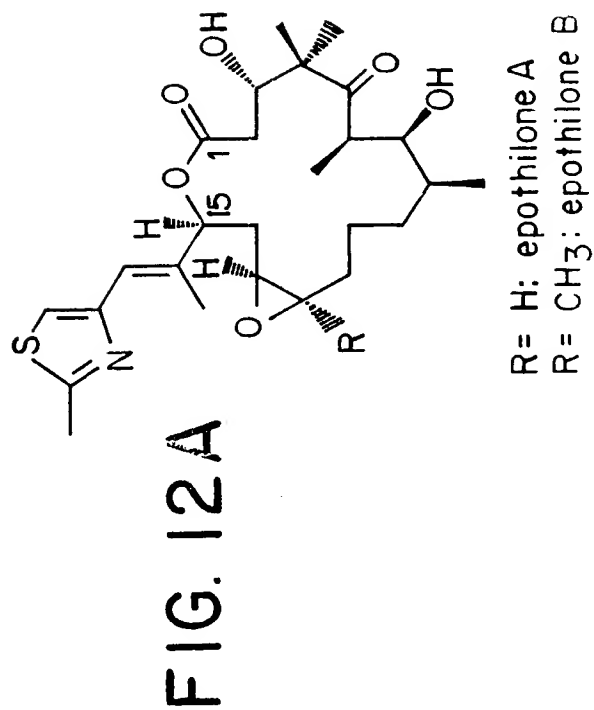
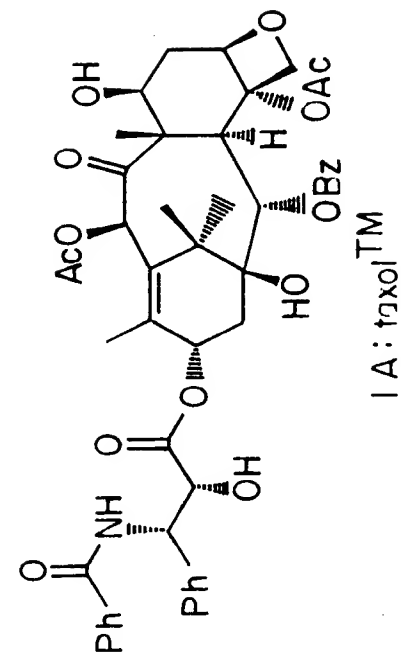
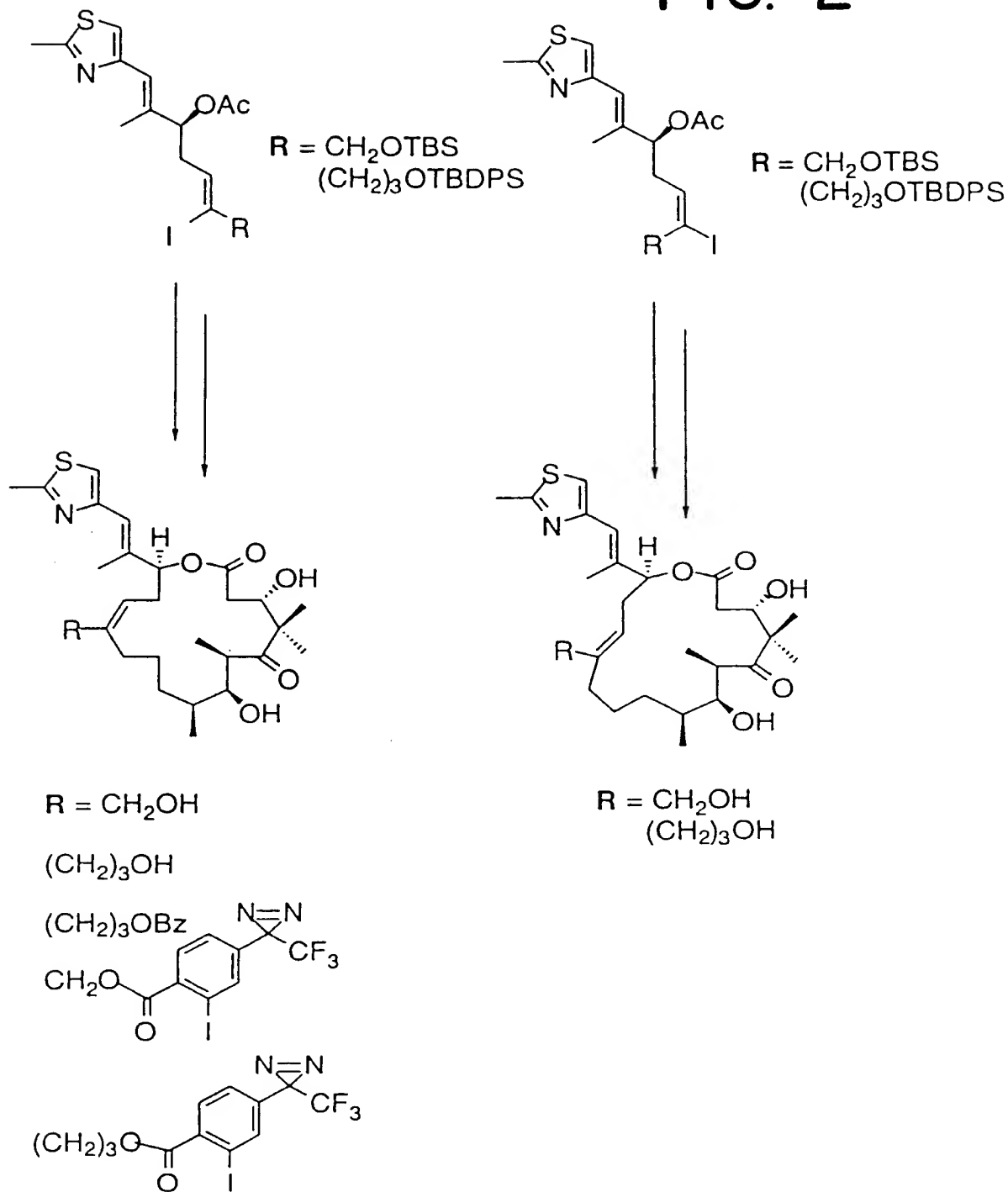


FIG. 2



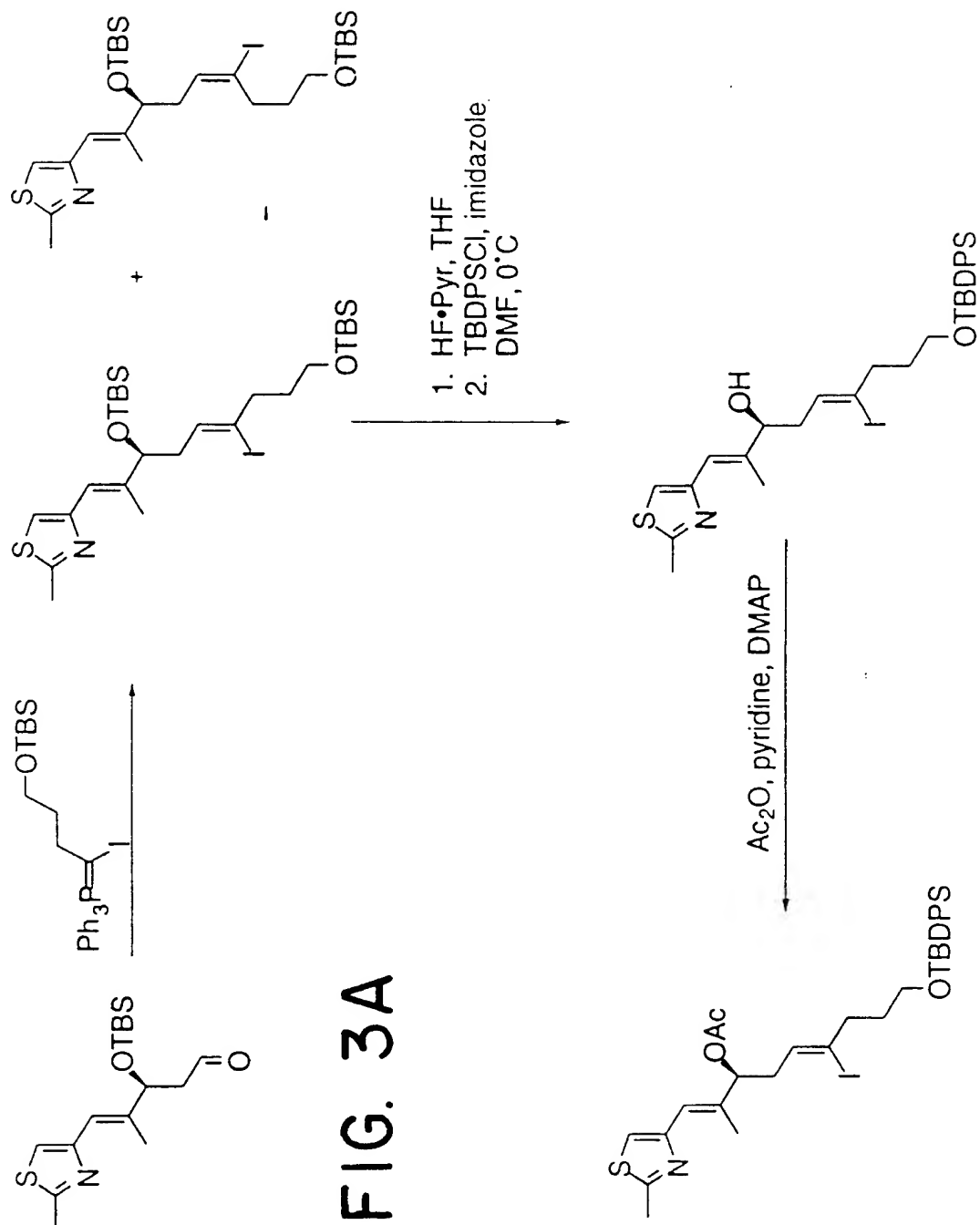
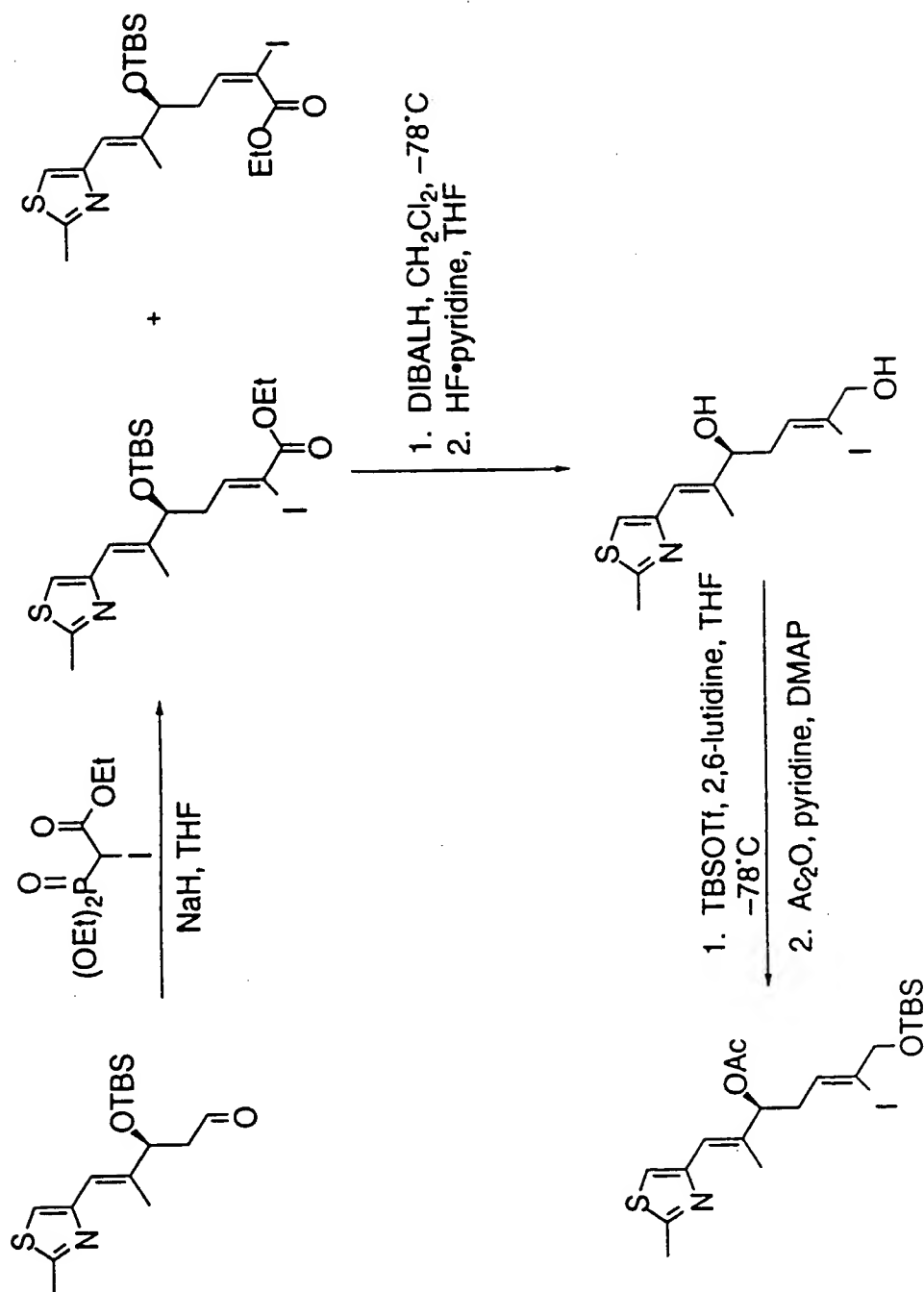
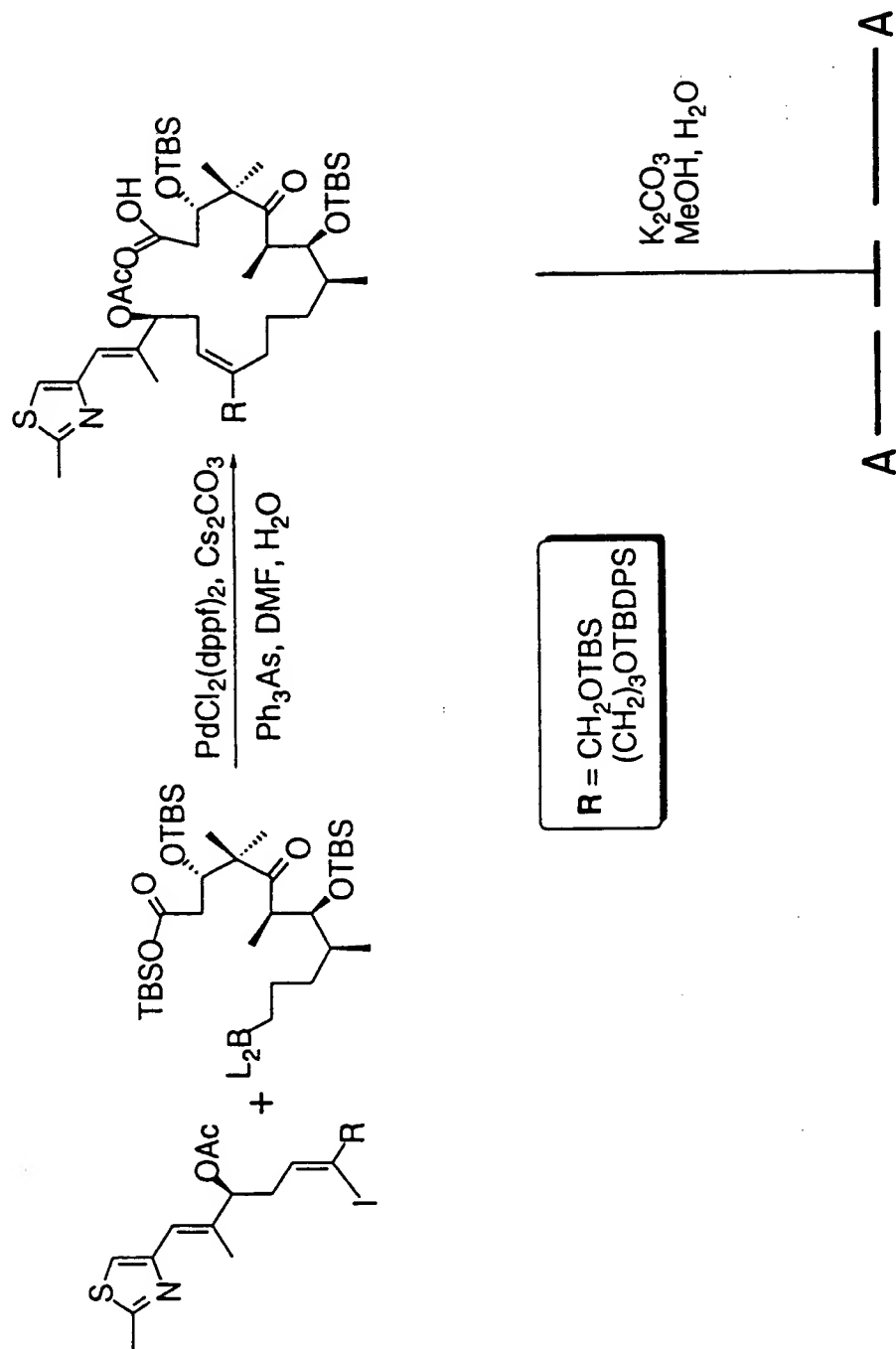


FIG. 3A

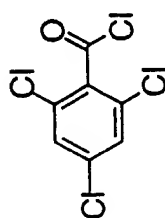
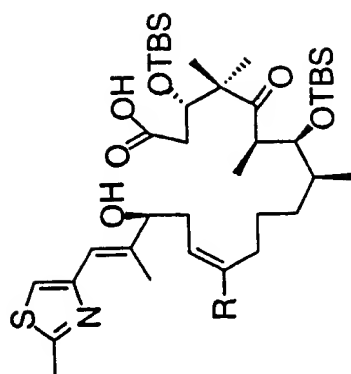
FIG. 3B



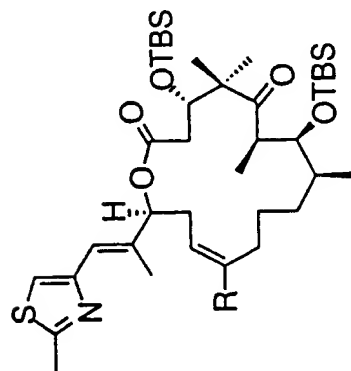
U  
M  
G.  
F



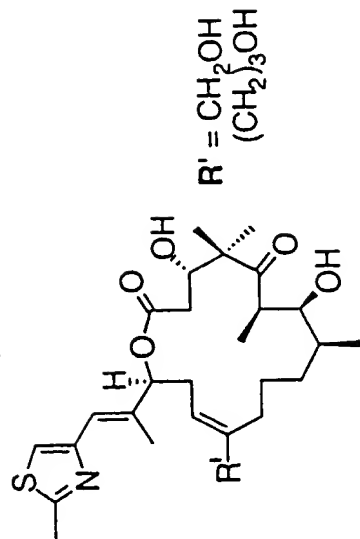
A ——— A



TEA, 4-DMAP, C<sub>6</sub>H<sub>6</sub>

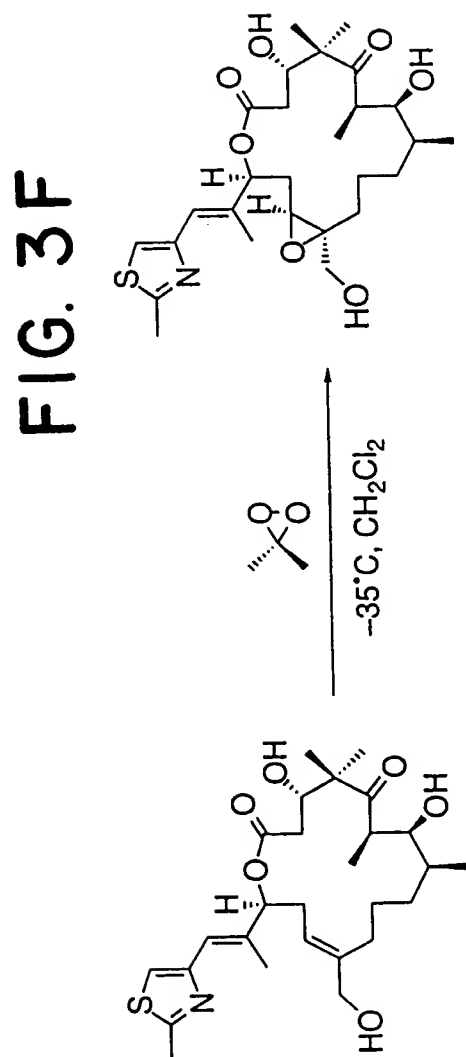
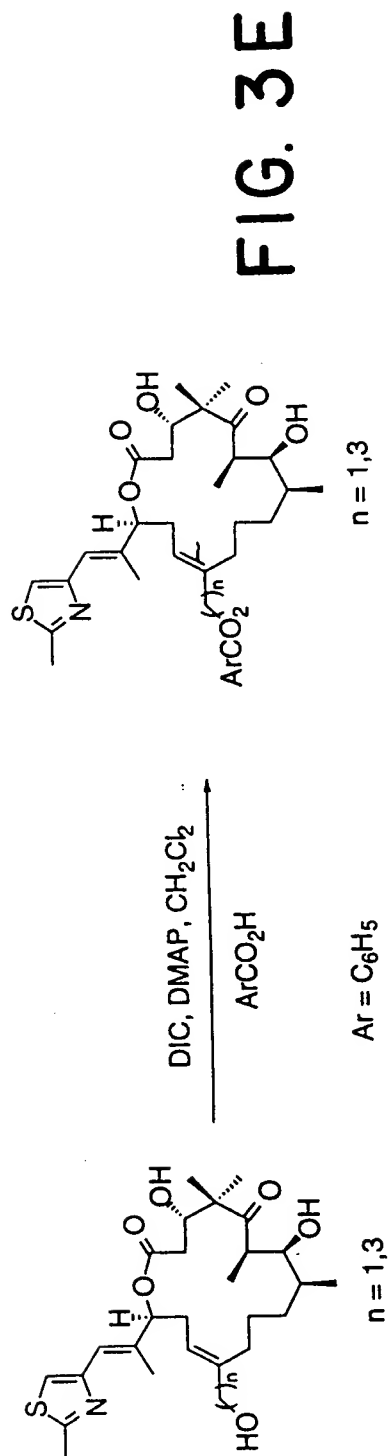


HF•pyridine  
THF, 25°C



R' = CH<sub>2</sub>OH  
(CH<sub>2</sub>)<sub>3</sub>OH

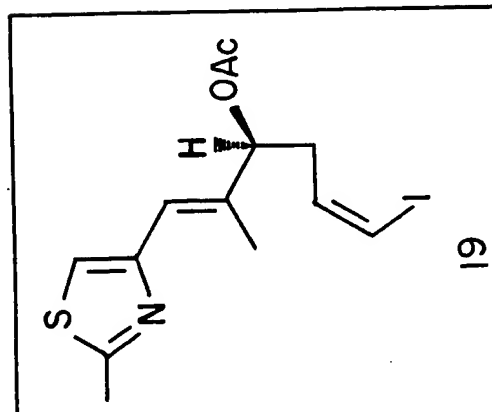
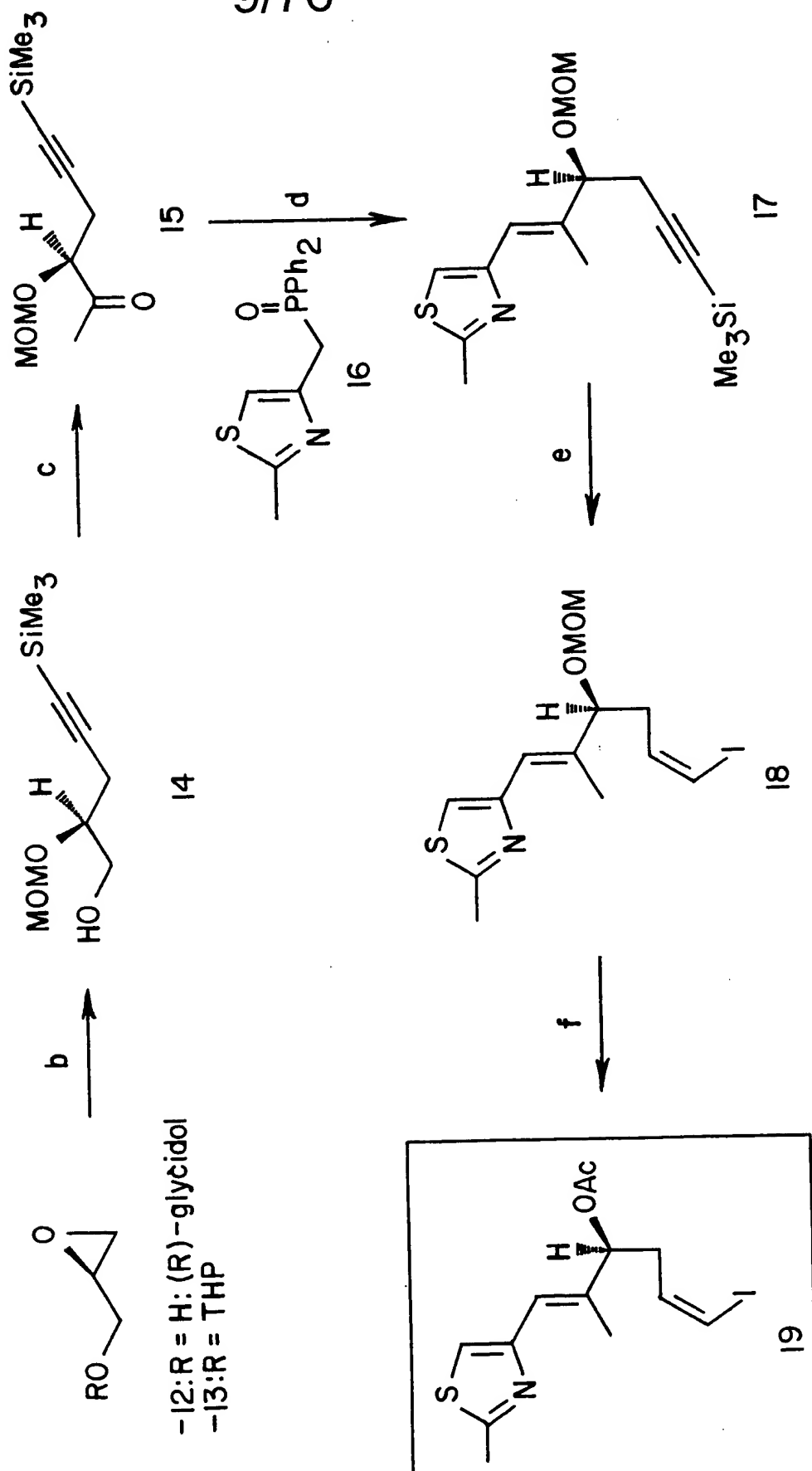
FIG. 3D





9/76

FIG. 4A



10/76

FIG. 4B

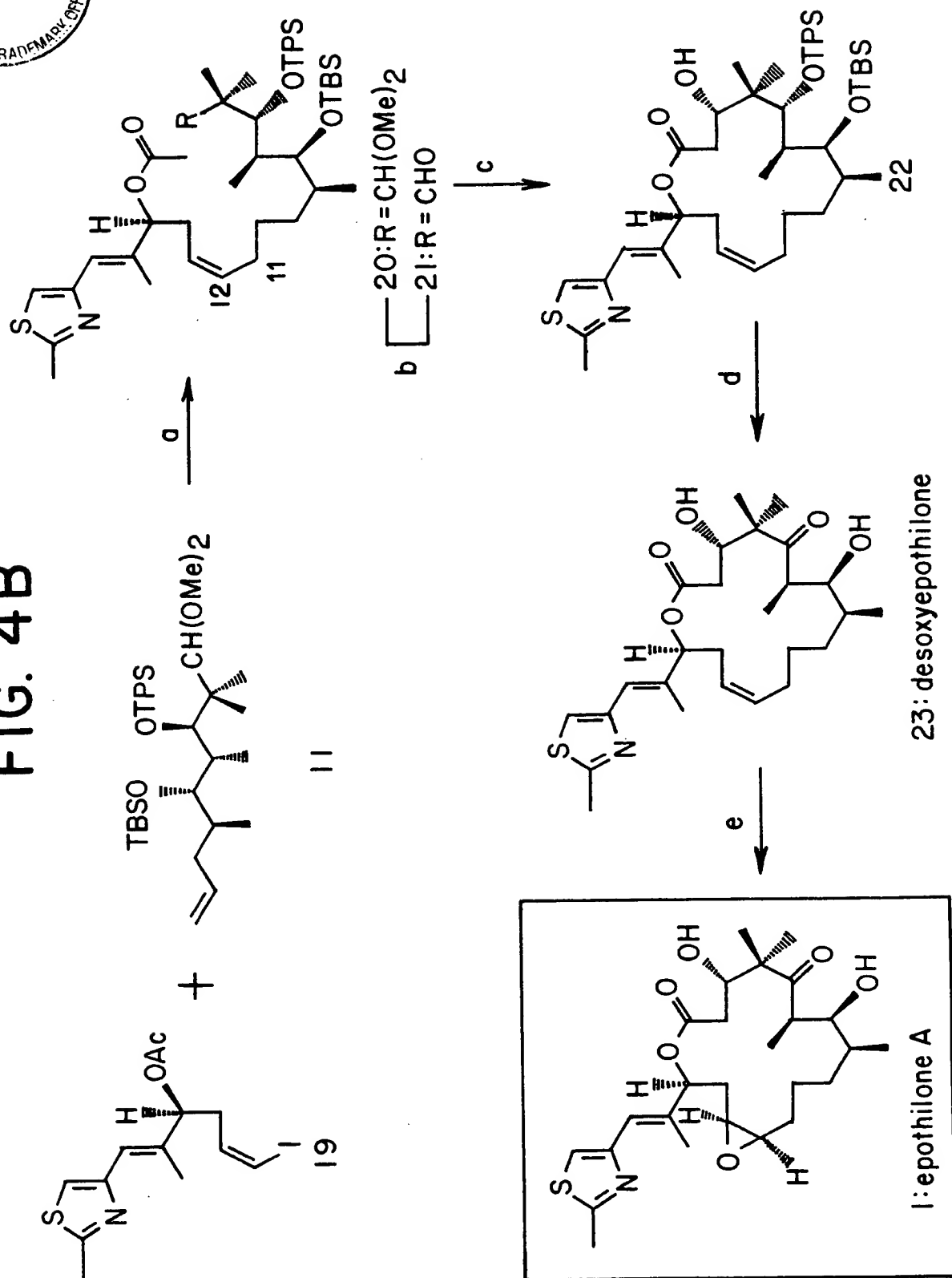
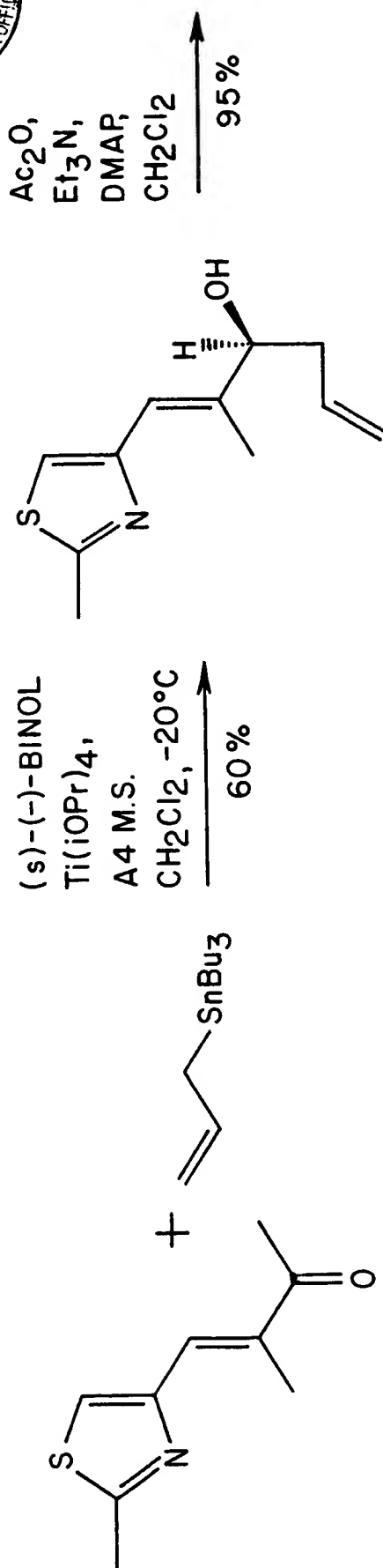
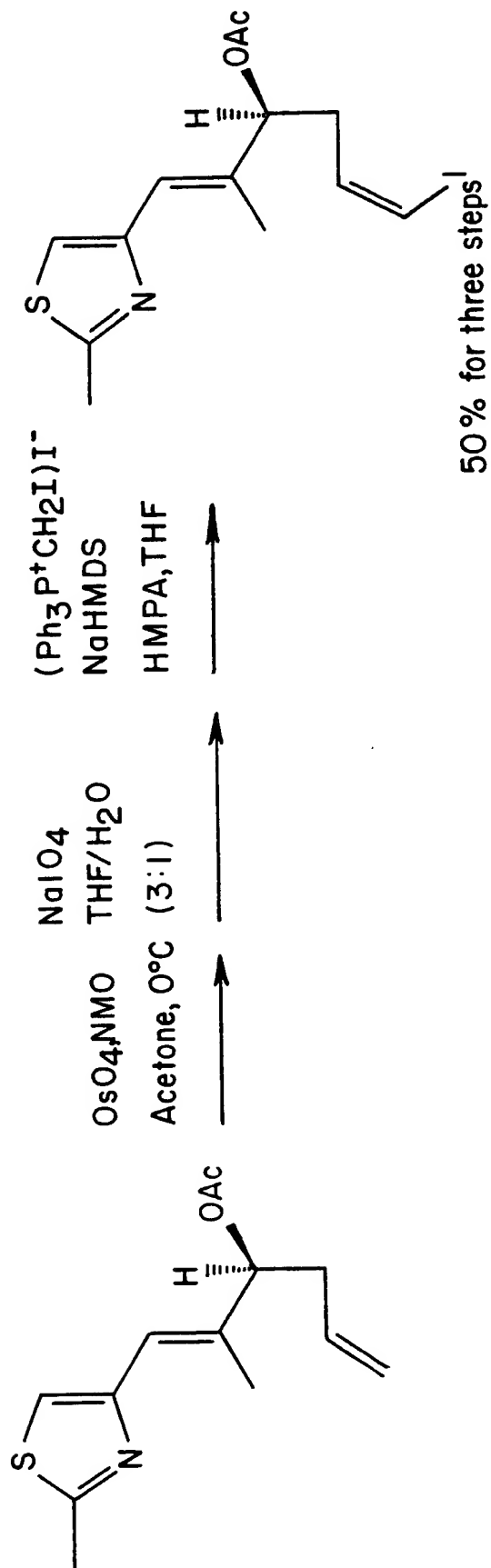


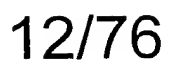


FIG. 5



11/76





**FIG. 6A**

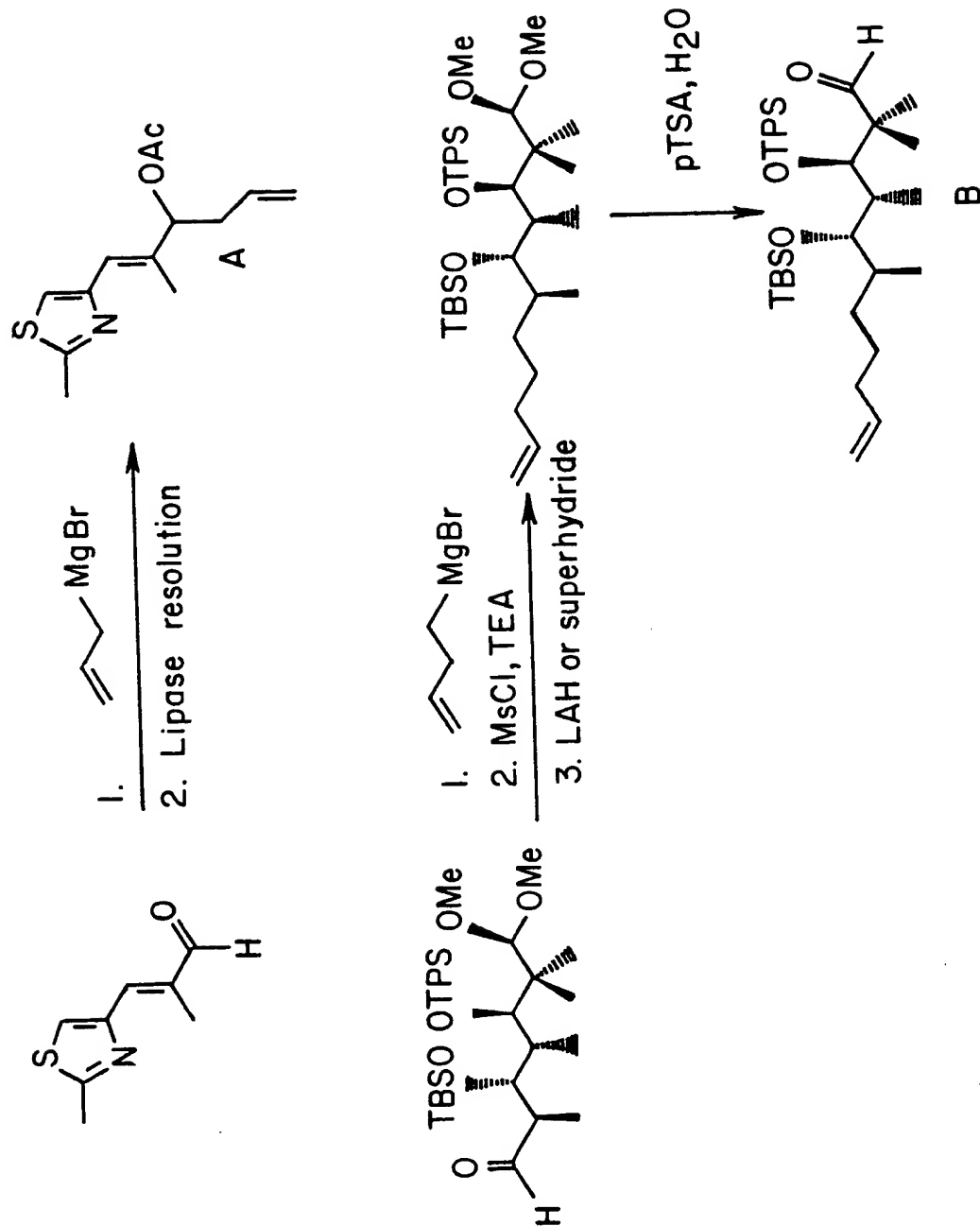
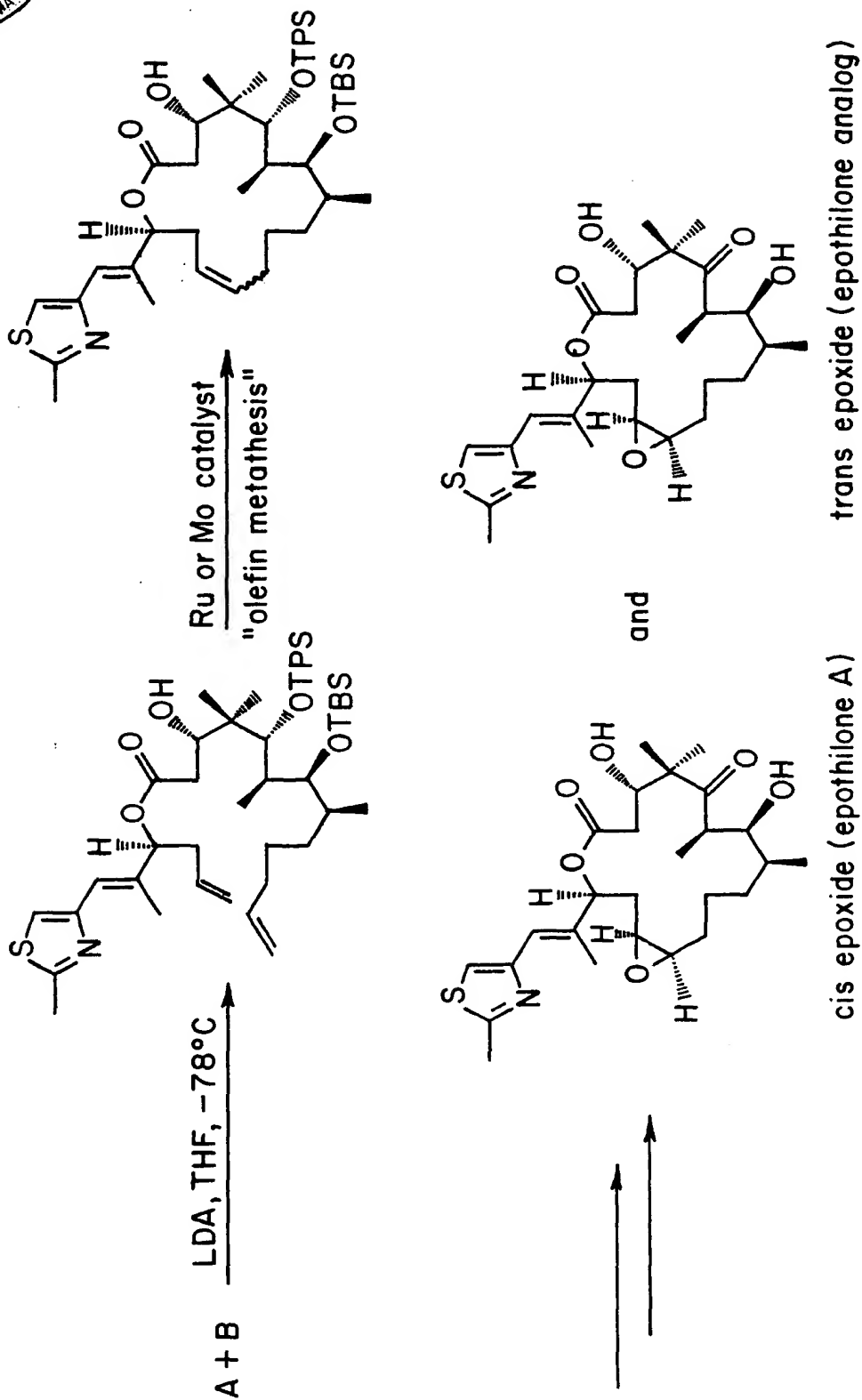
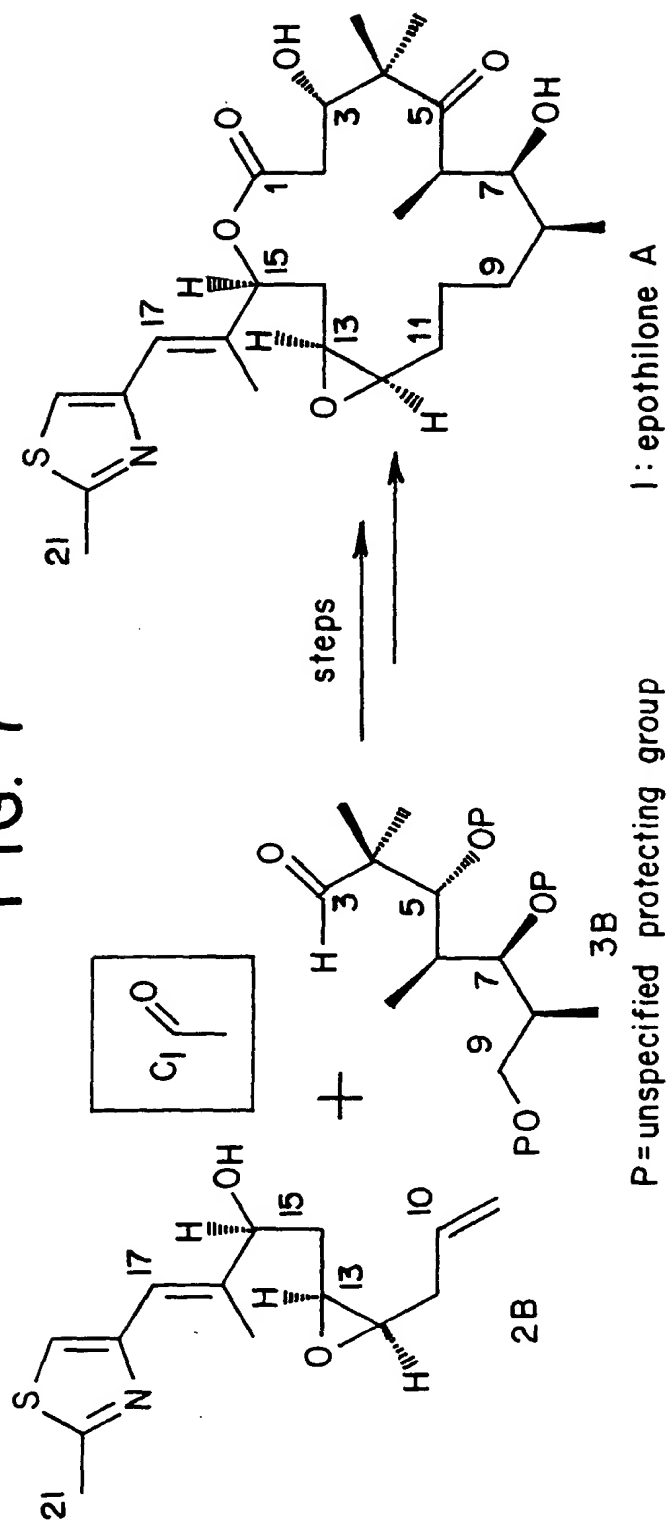


FIG. 6B

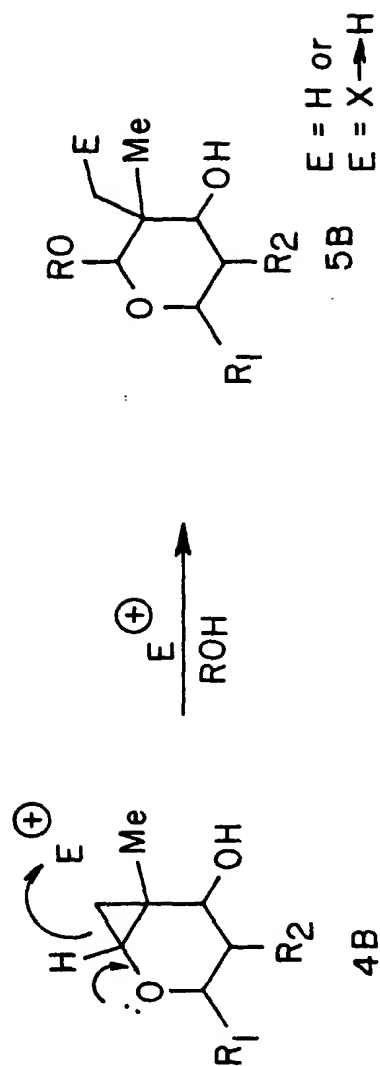


\*17 steps from known starting materials vs. 27 steps for aldol macrocyclization

FIG. 7



Convergent strategy for a total synthesis of epothilone A (1).



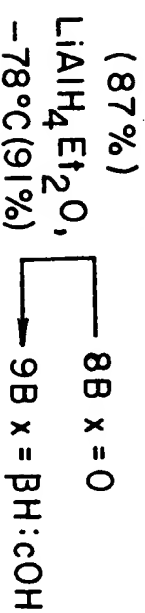
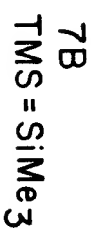
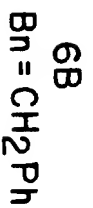
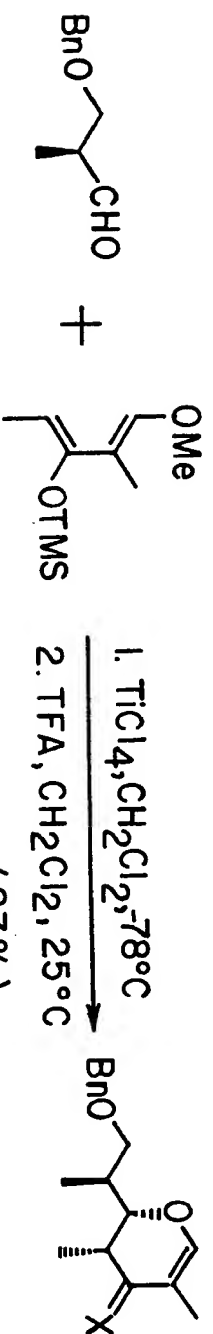


FIG. 8

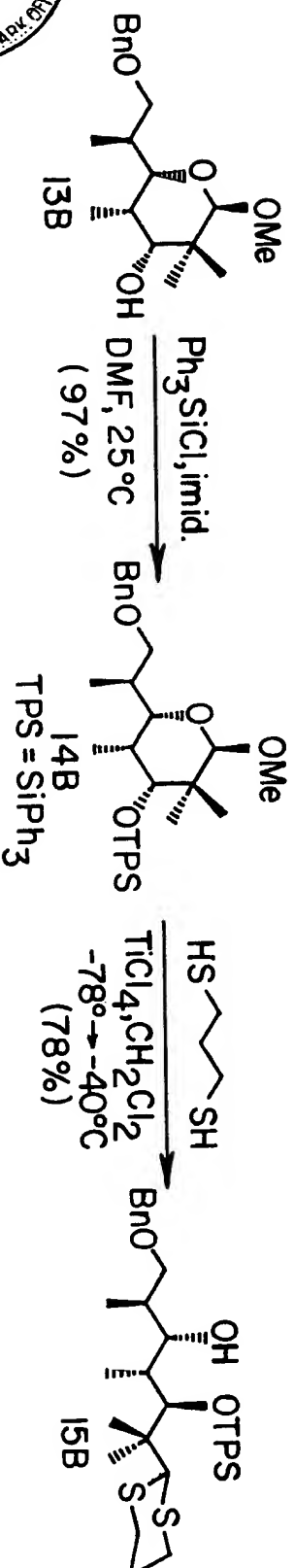
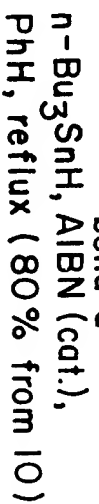
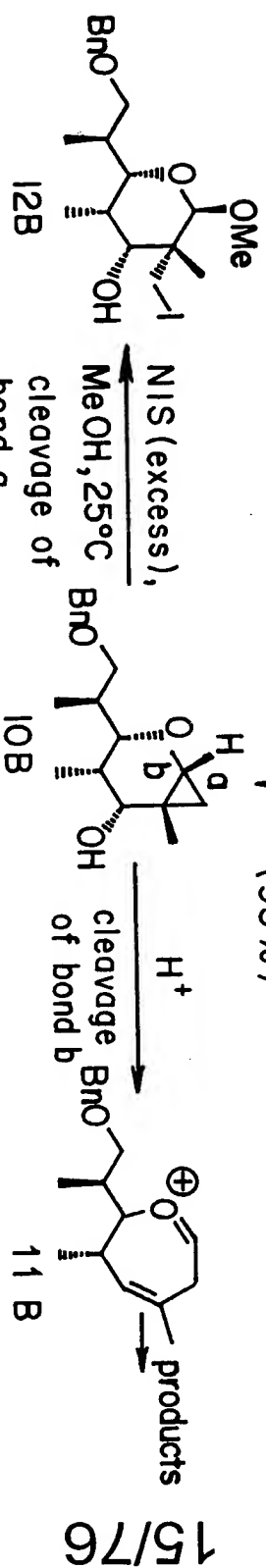
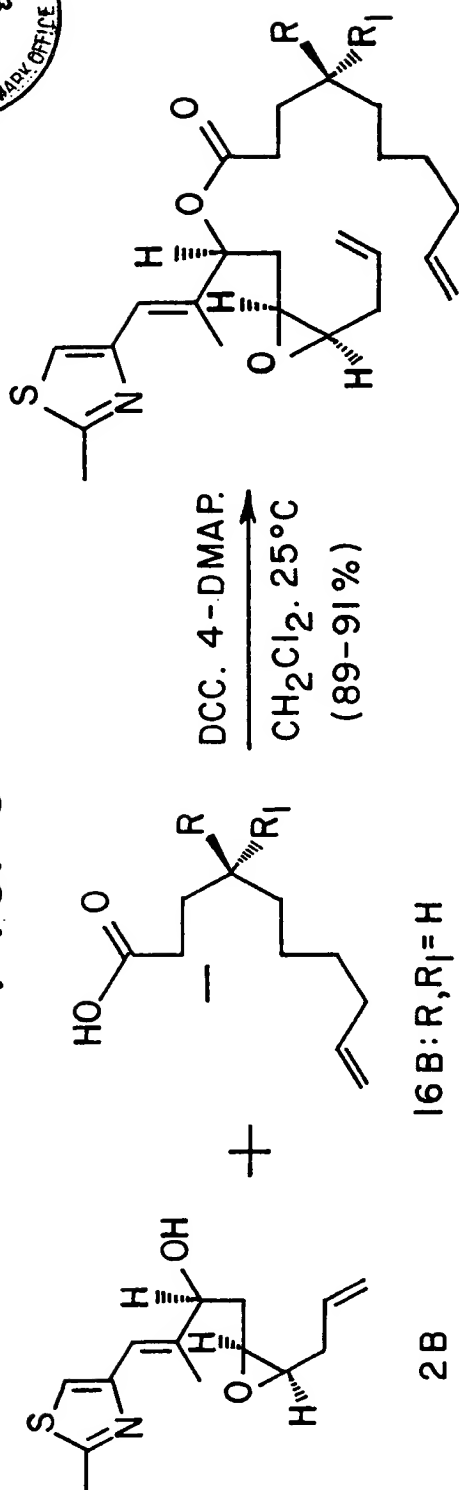


FIG. 9



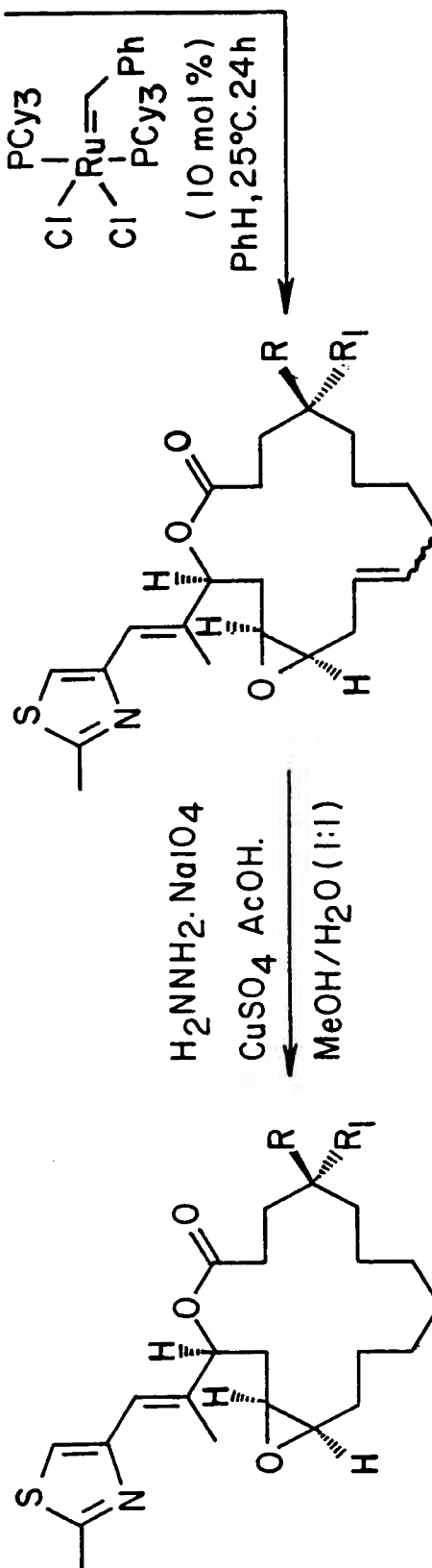
2B

16B: R, R<sub>1</sub> = H  
17B: R, R<sub>1</sub> = CH<sub>3</sub>

18B: R, R<sub>1</sub> = H

19B: R, R<sub>1</sub> = CH<sub>3</sub>

16/76



22B: R, R<sub>1</sub> = H

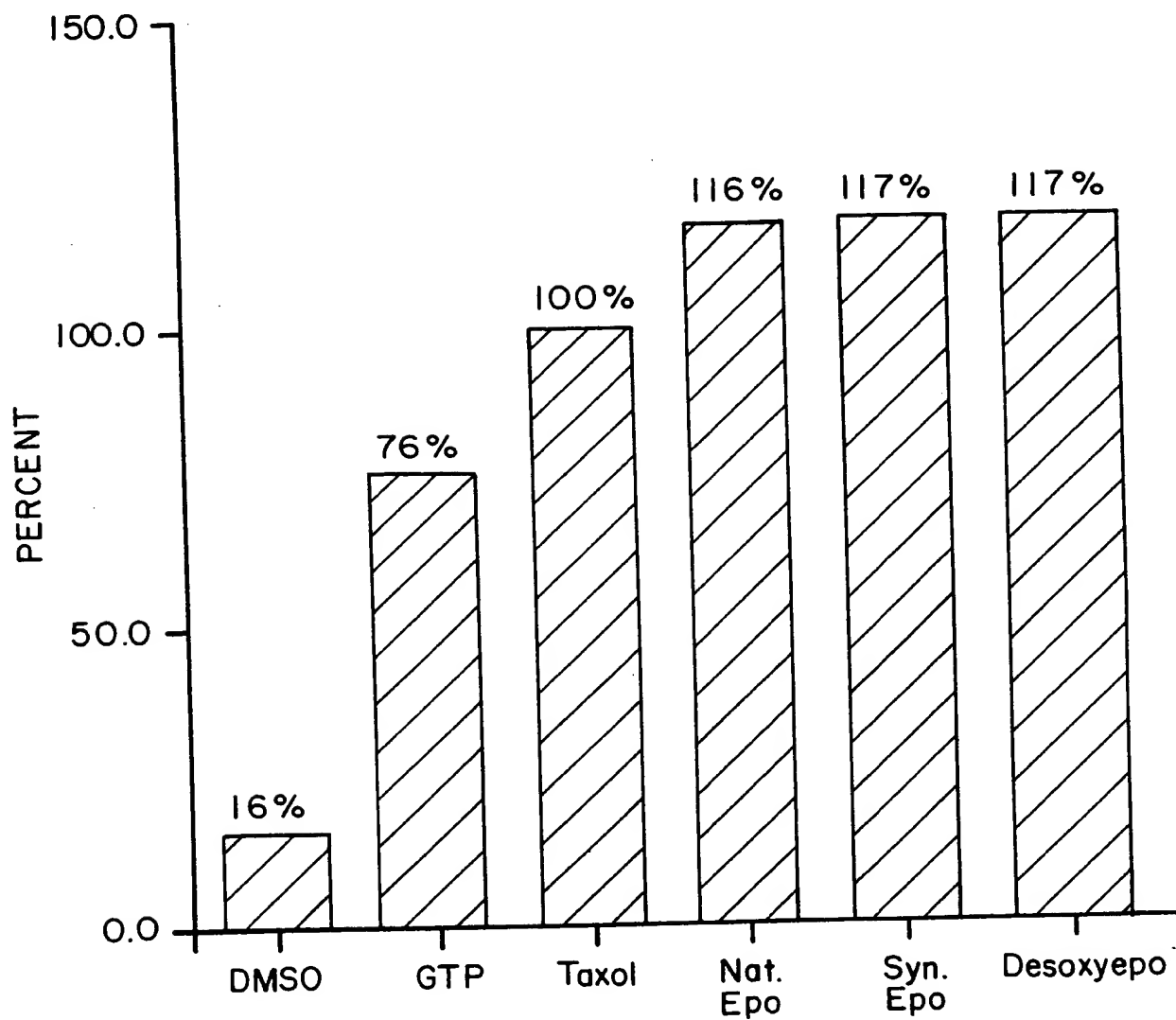
20B: R, R<sub>1</sub> = H (E:Z ca. 1:1, 45%)  
21B: R, R<sub>1</sub> = CH (one stereoisomer, 70%)





17/76

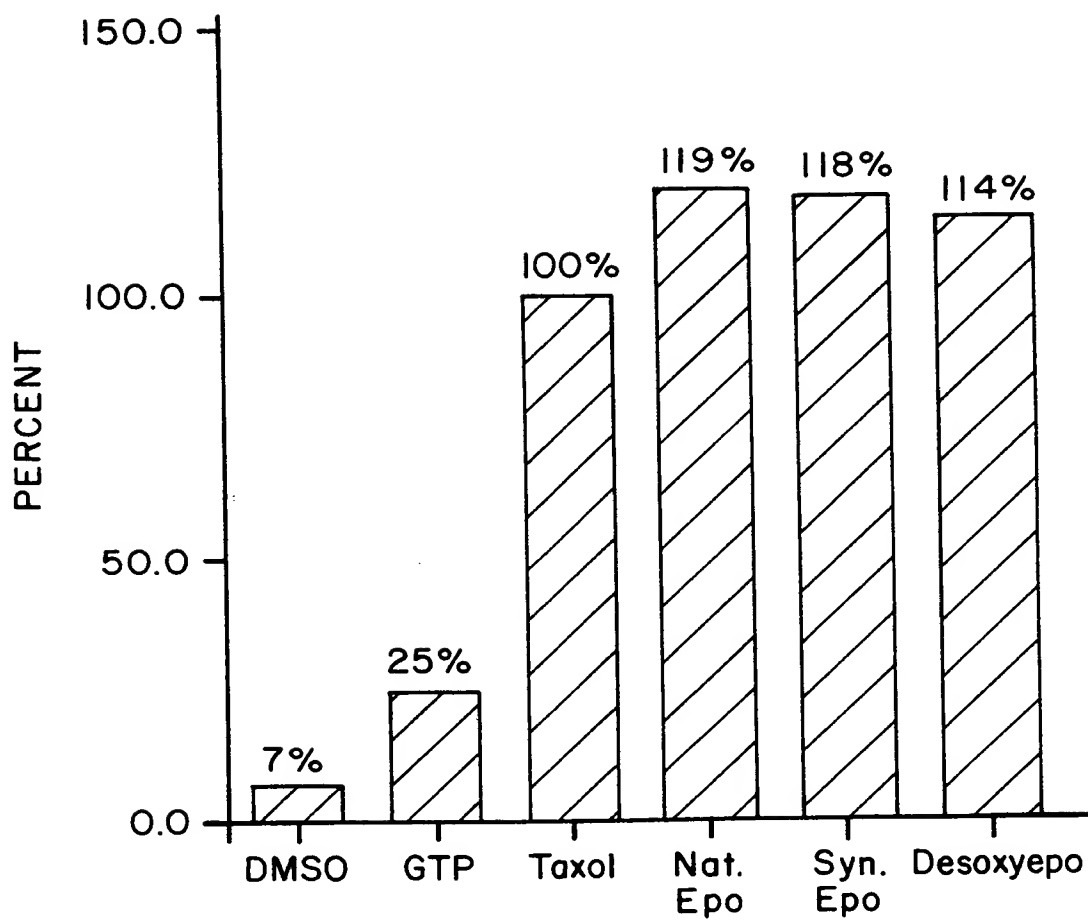
FIG. 10





18/76

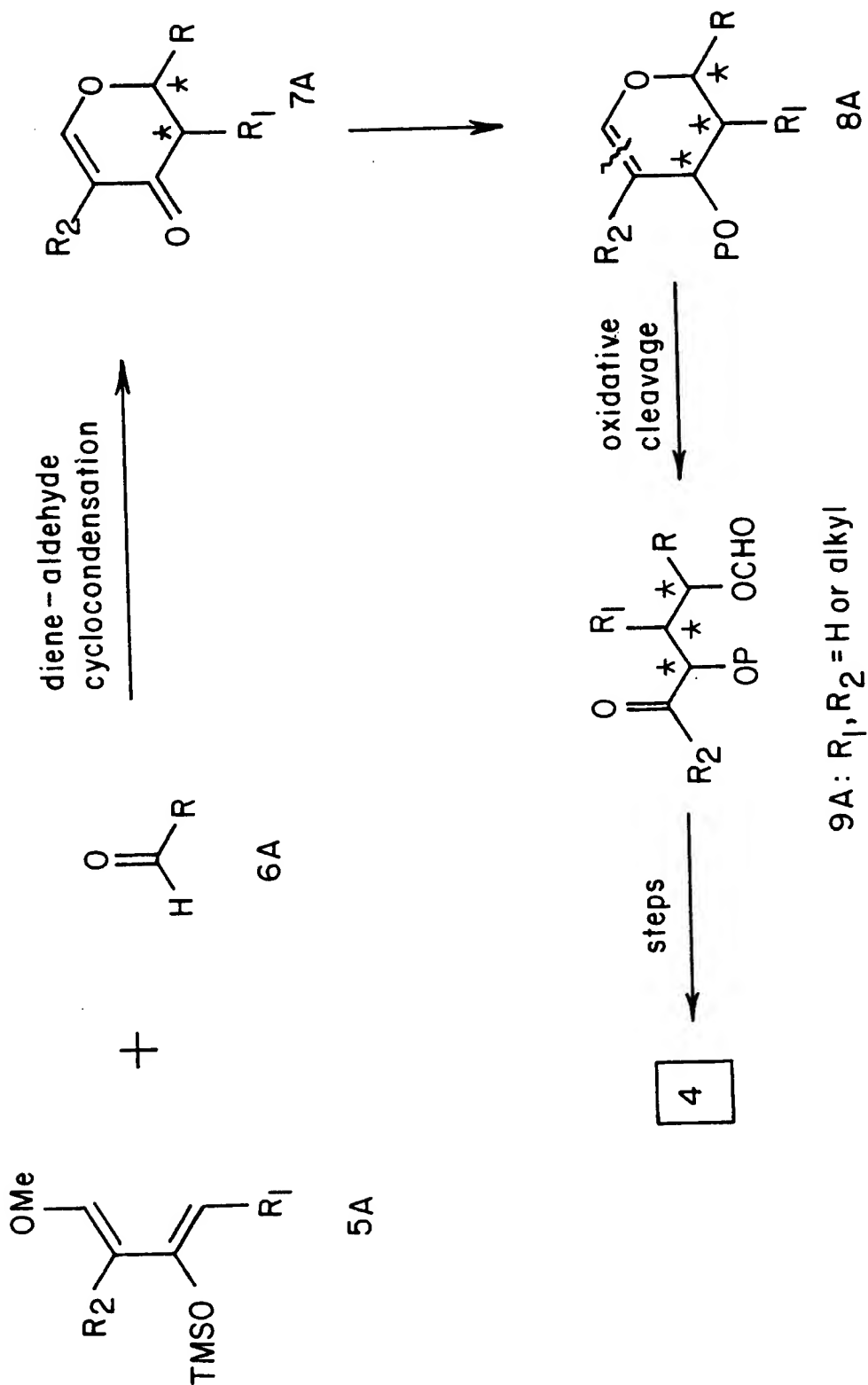
FIG. 11





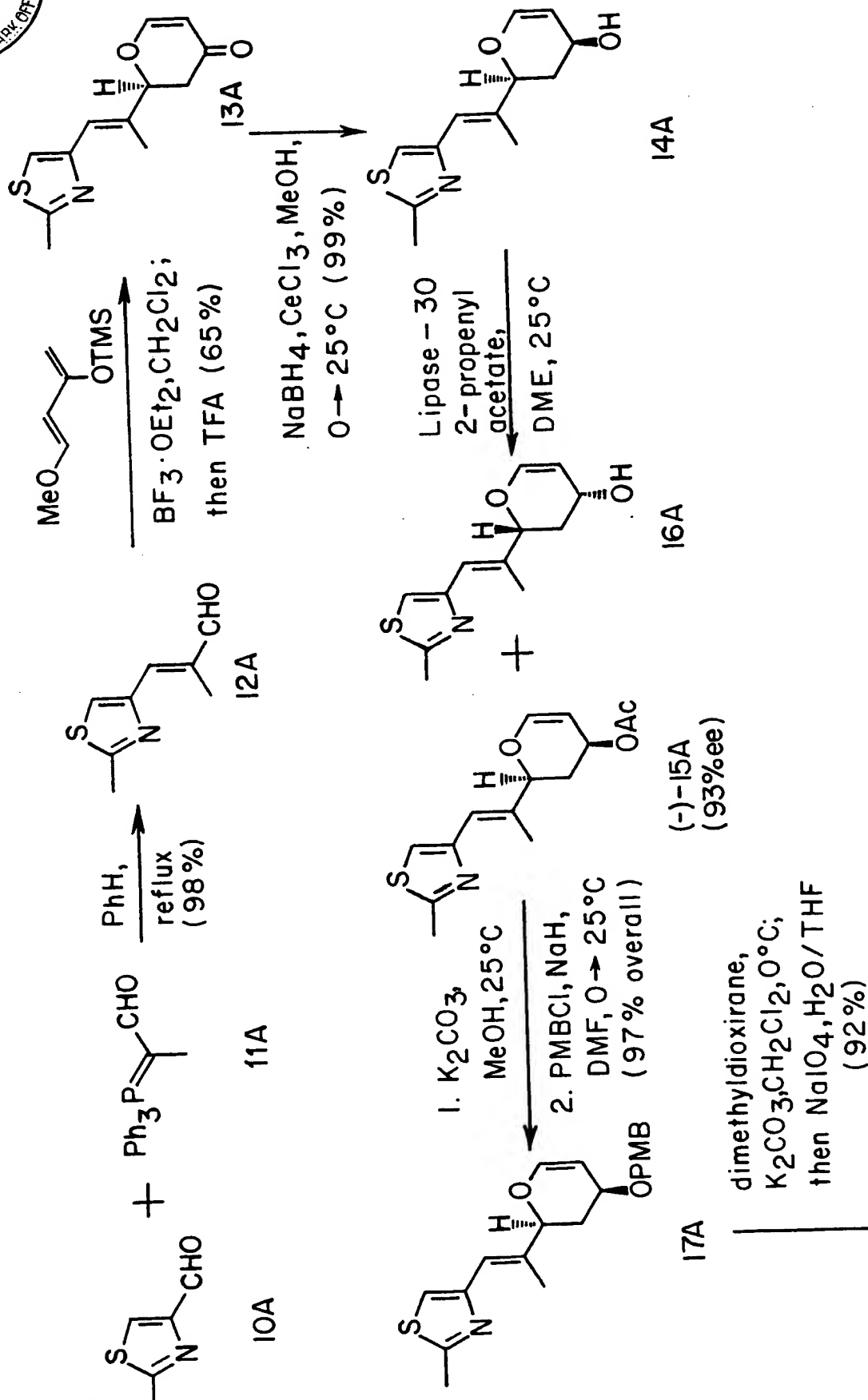
19/76

FIG. 13



20/76

FIG. 14A



A ————— A

FIG. 14B

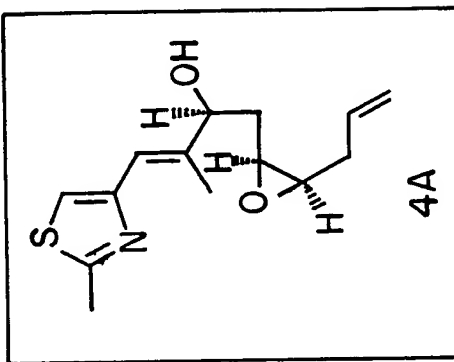
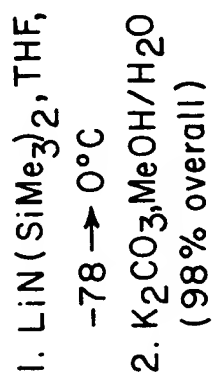
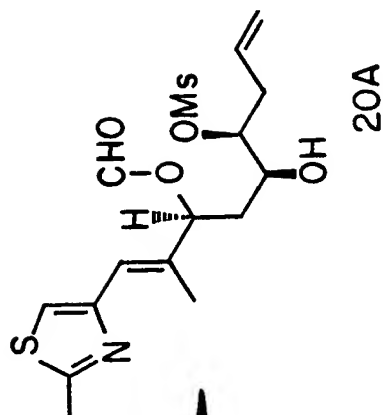
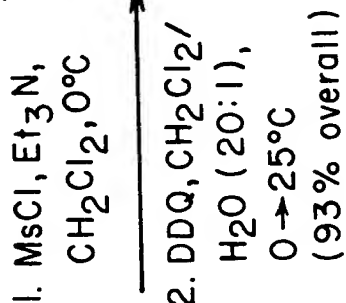
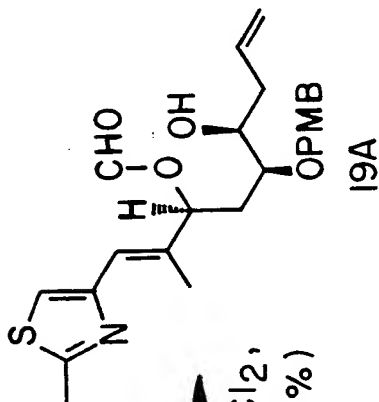
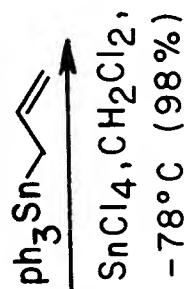
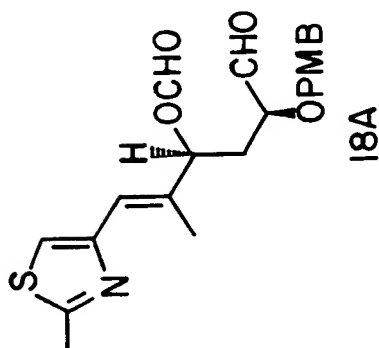
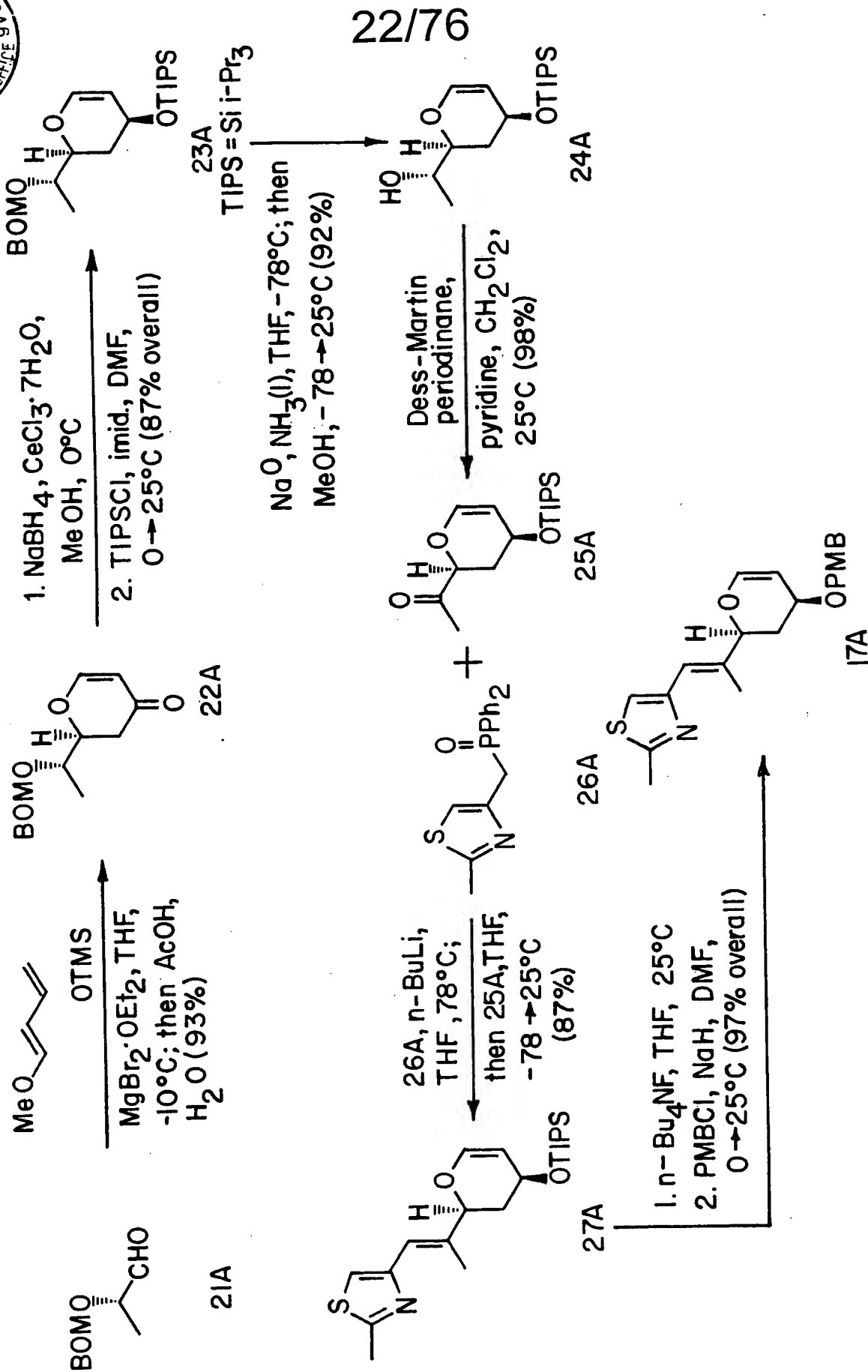
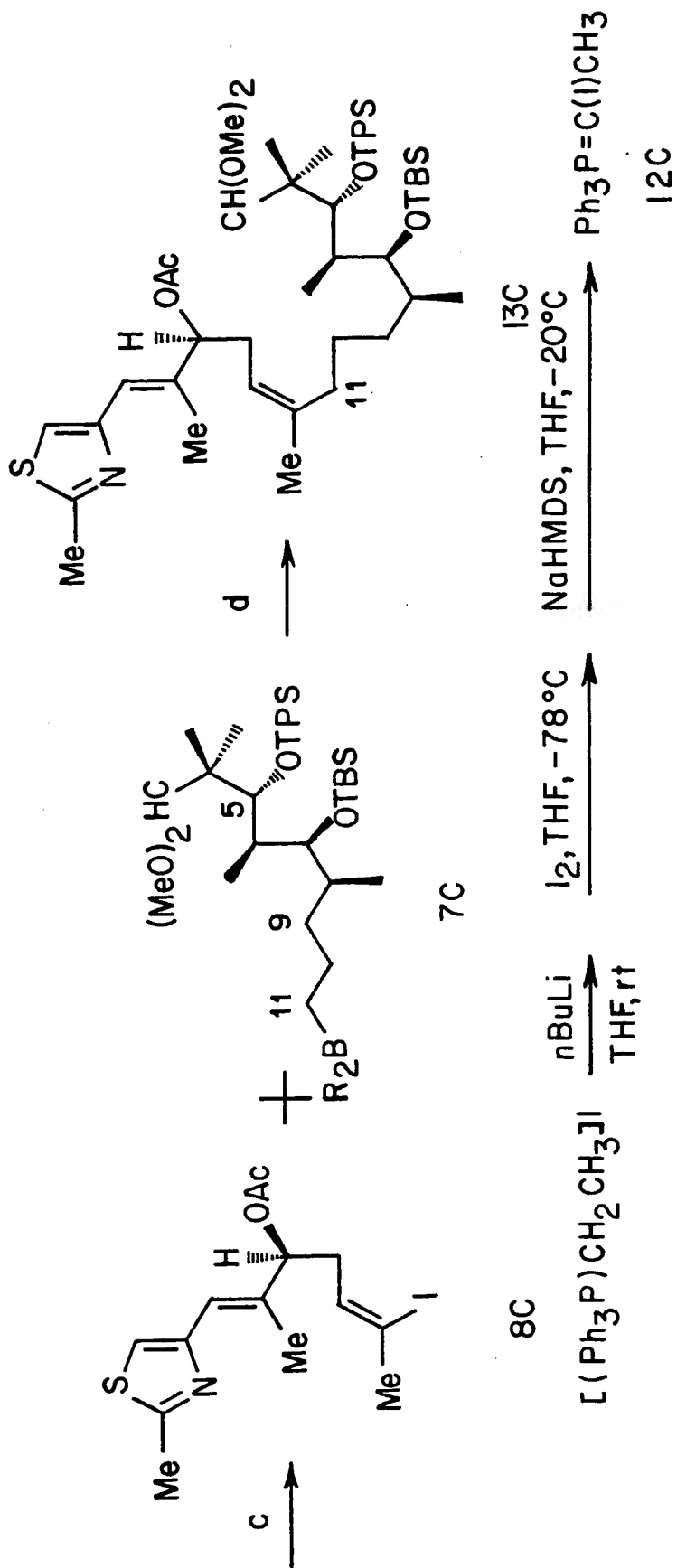


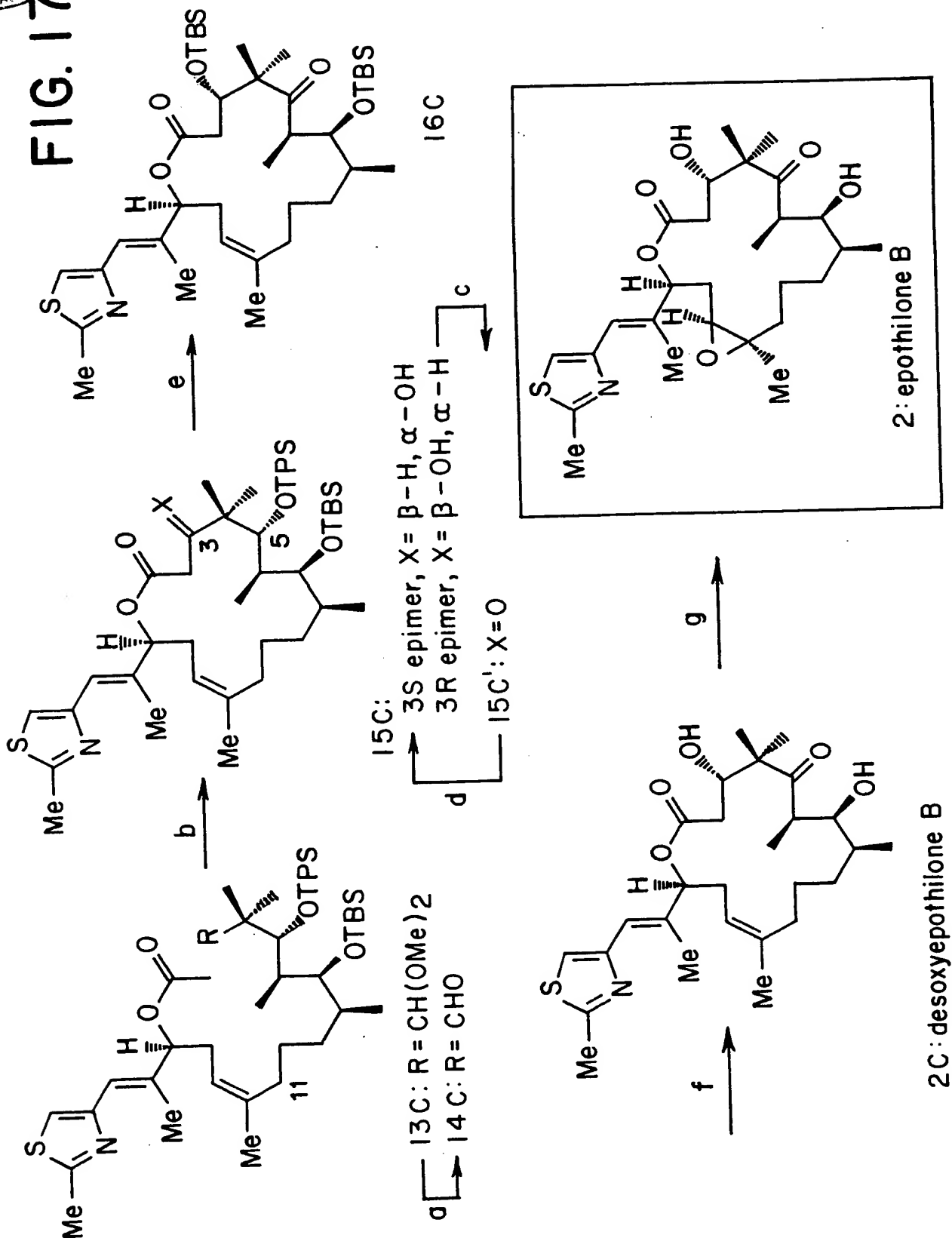
FIG. 15





24/76

FIG. 17





25/76

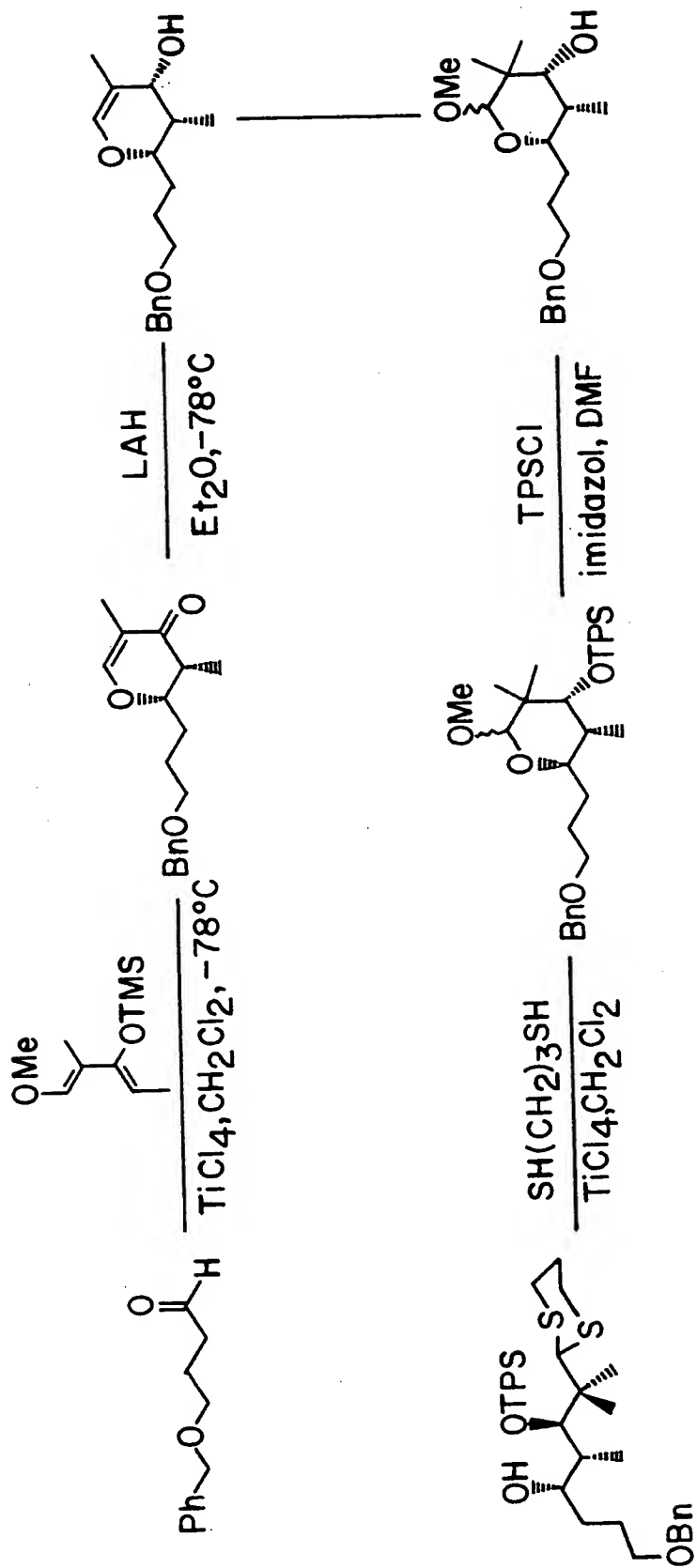
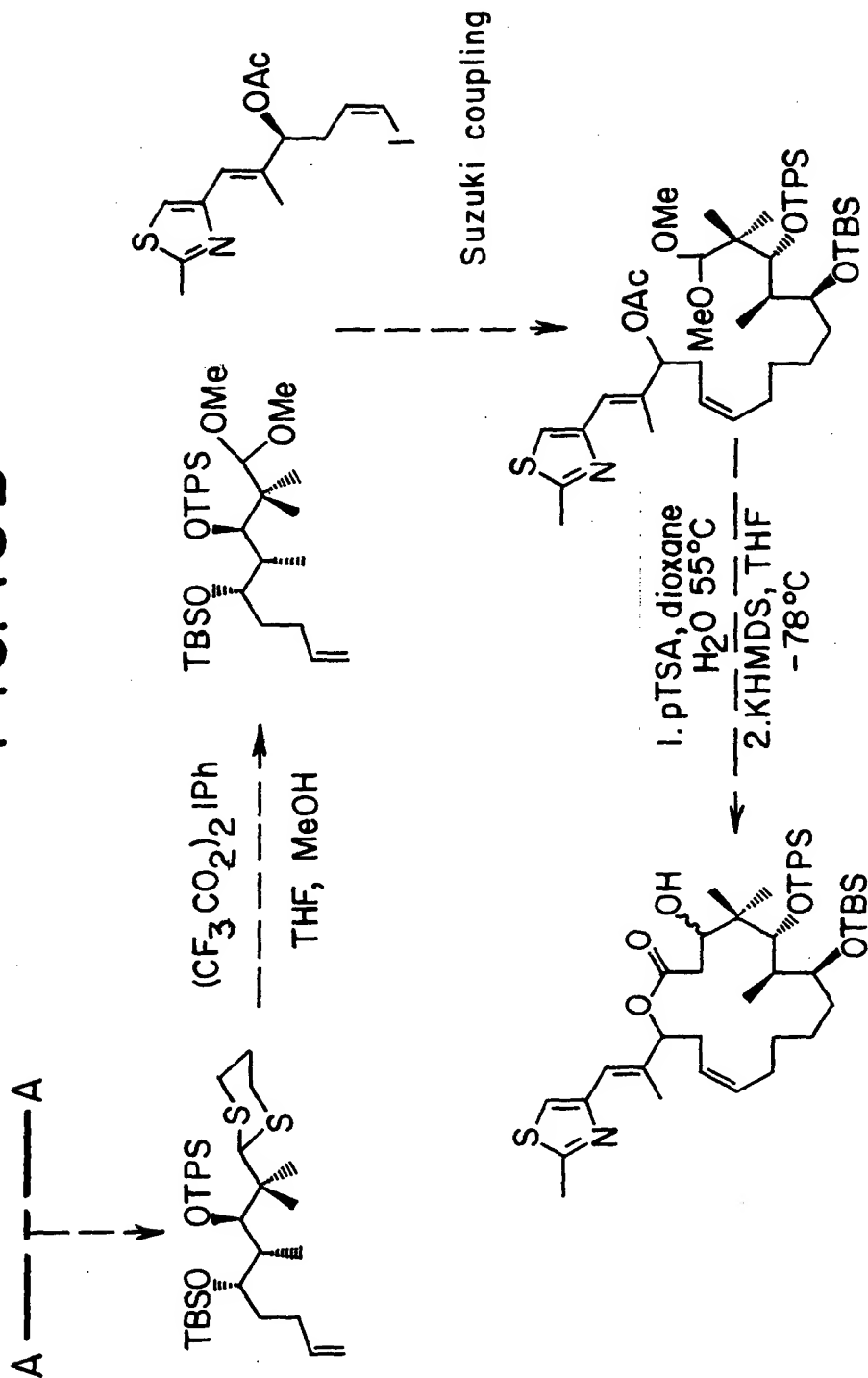


FIG. 18A

A ——— A

FIG. 18B



27/76

FIG. 19A

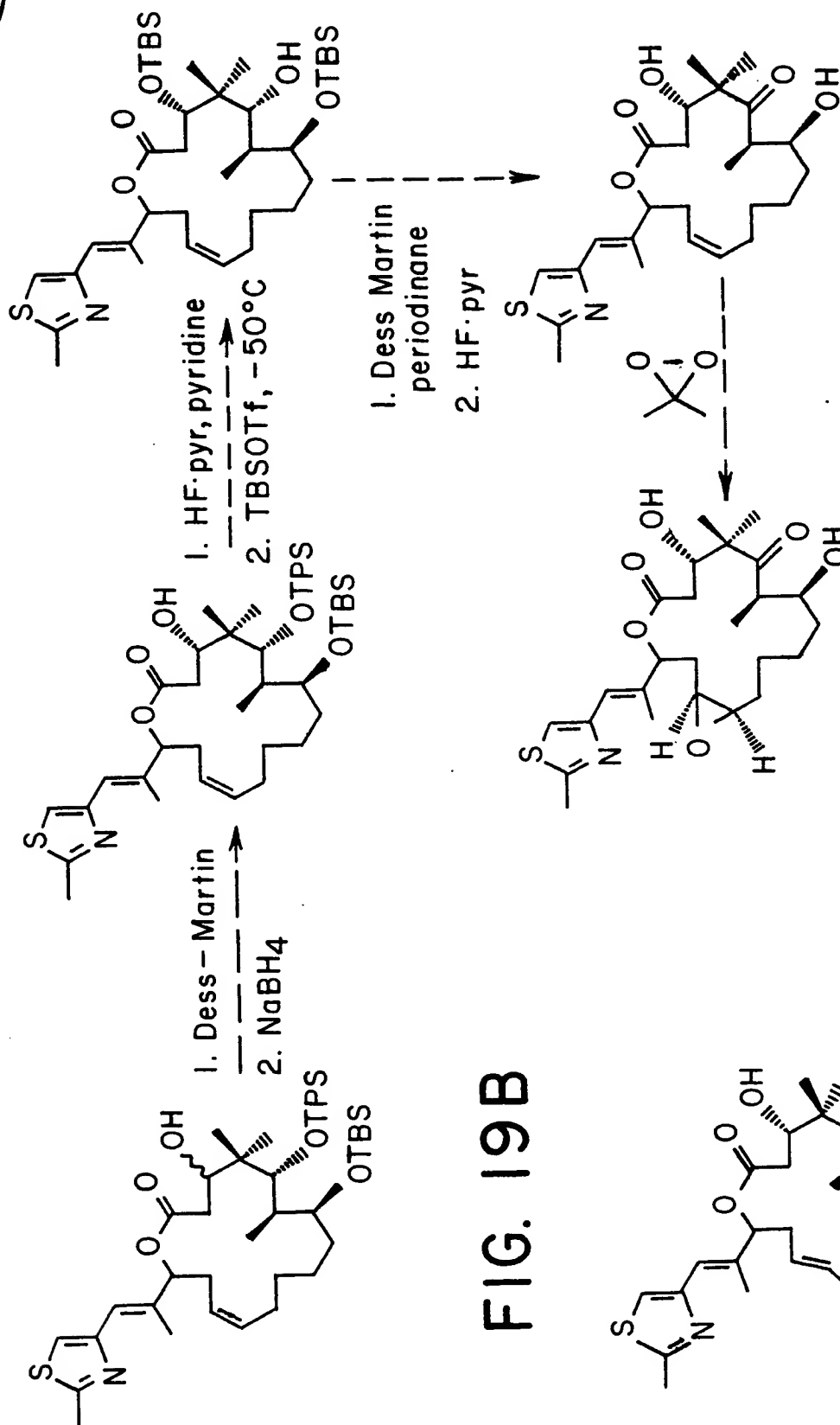


FIG. 19B

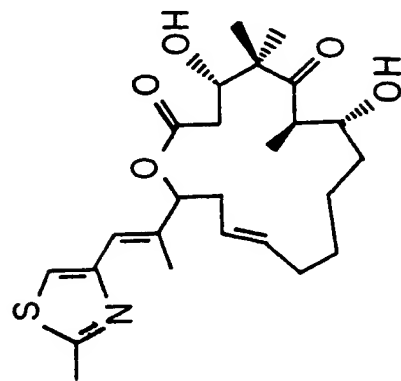


FIG. 19C

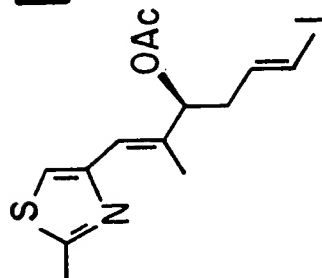
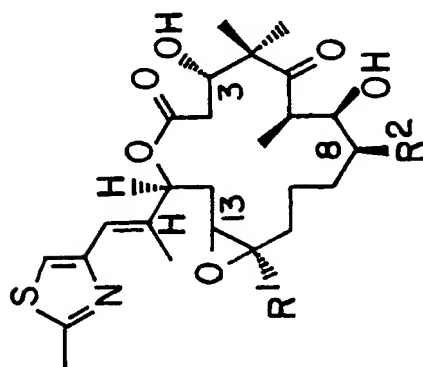


FIG. 20A



R<sup>1</sup> = H, R<sup>2</sup> = Me; epothilone A

R<sup>1</sup> = R<sup>2</sup> = Me; epothilone B

R<sup>1</sup> = R<sup>2</sup> = H; C<sub>8</sub>-desmethyl-epothilone A (3D)

28/76

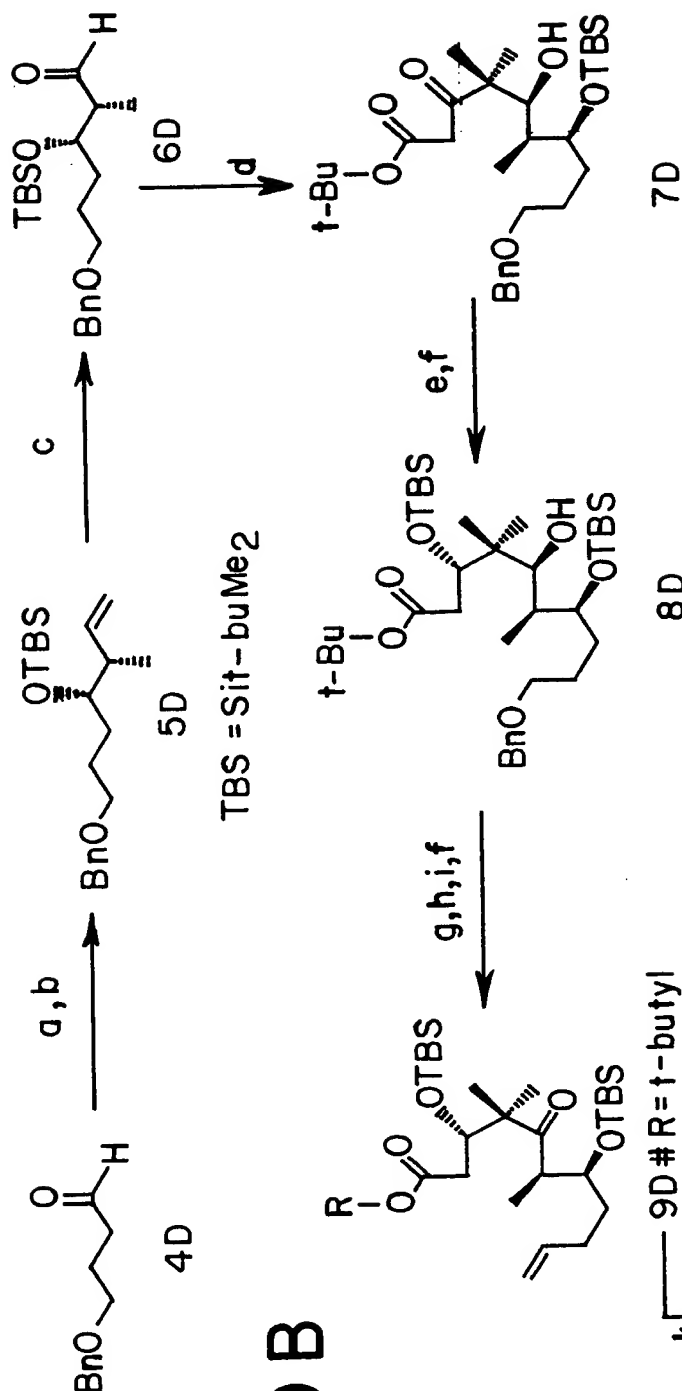


FIG. 20B

29/76

FIG. 21

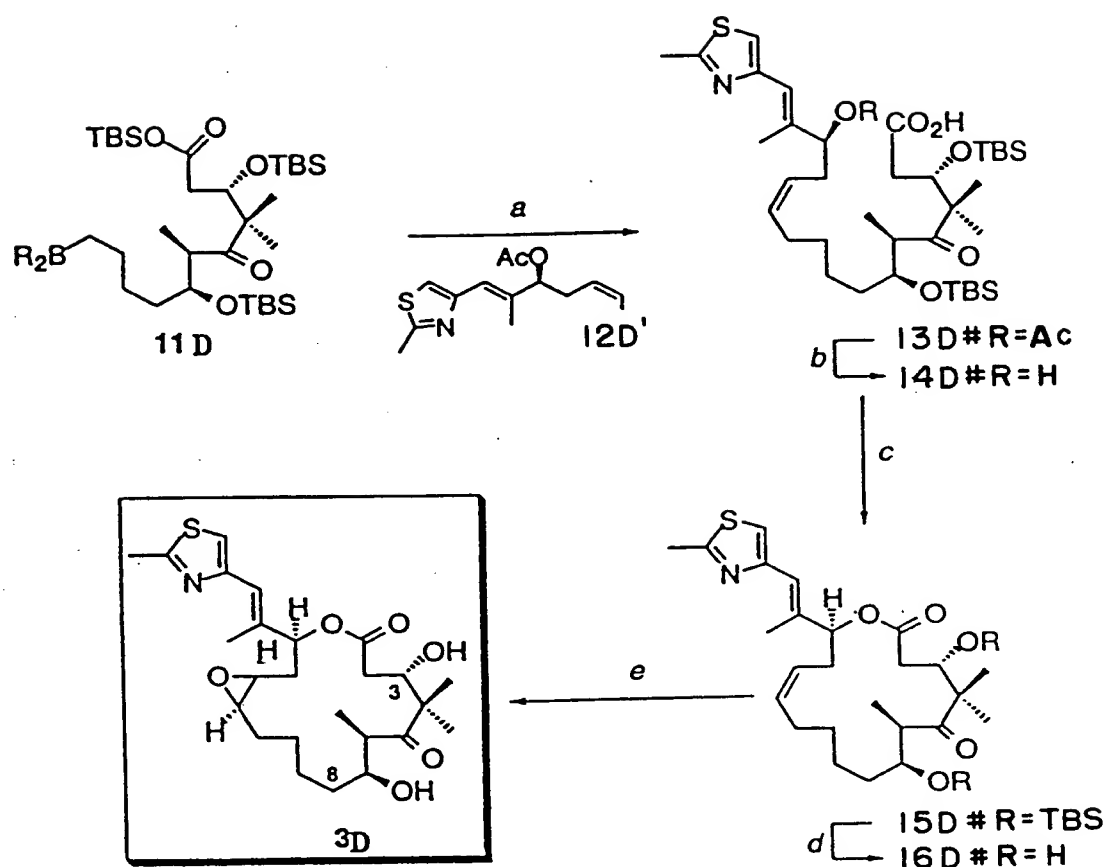


FIG. 22A

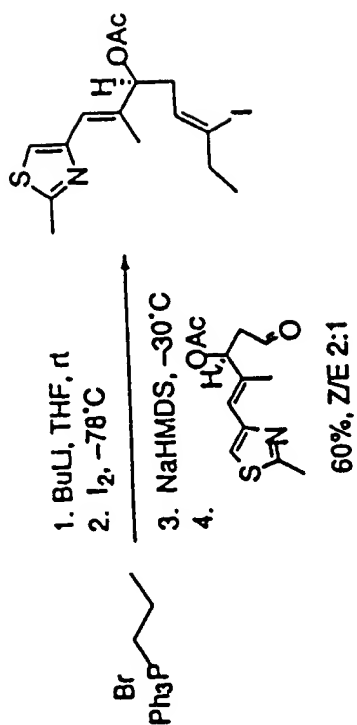
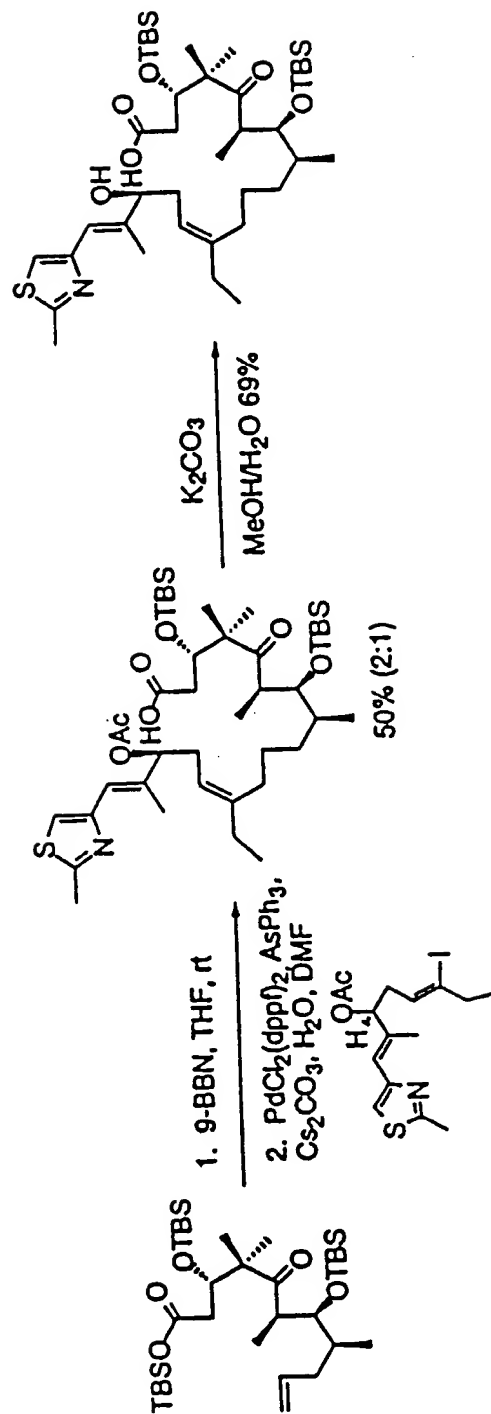


FIG. 22B



31/76

FIG. 22C

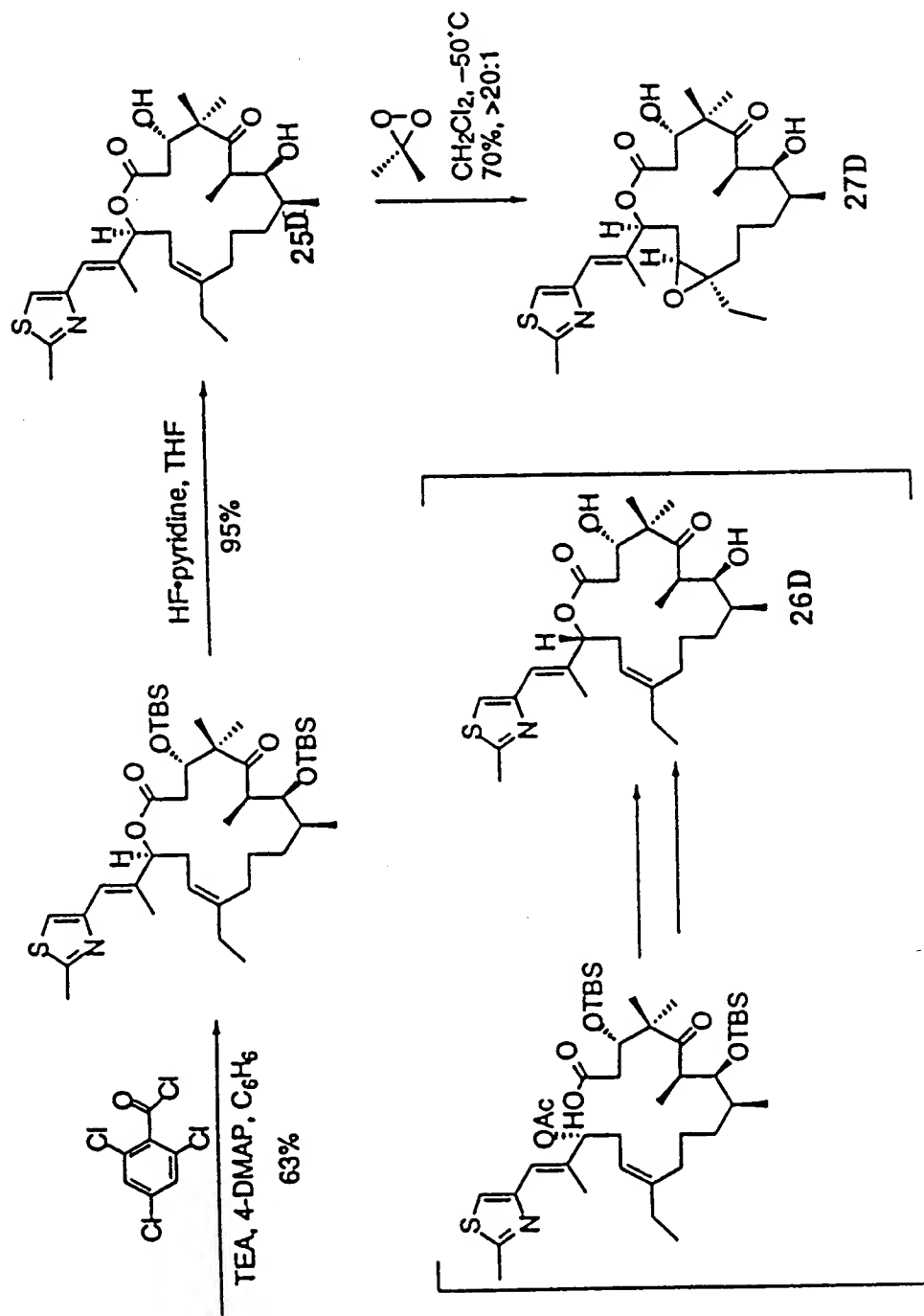


FIG. 23A

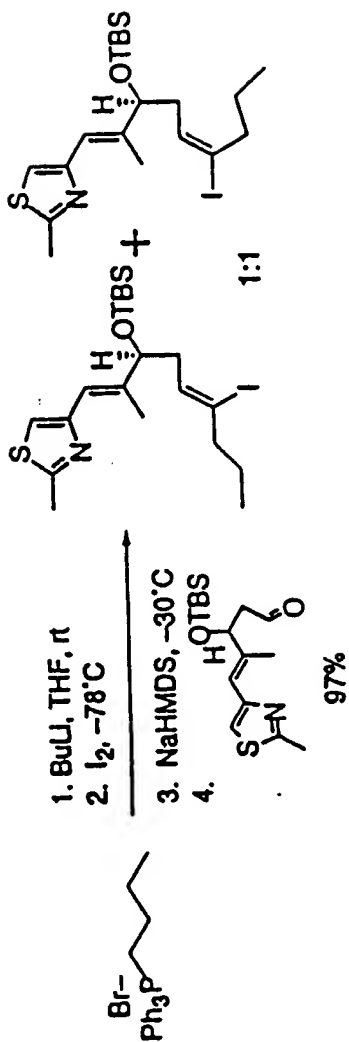


FIG. 23B

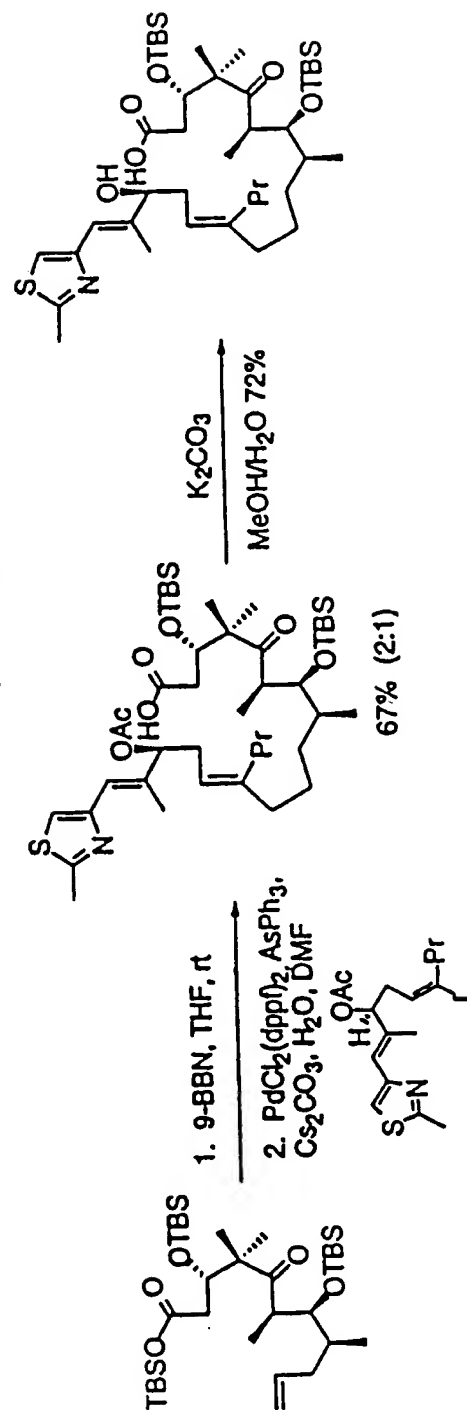




FIG. 23C

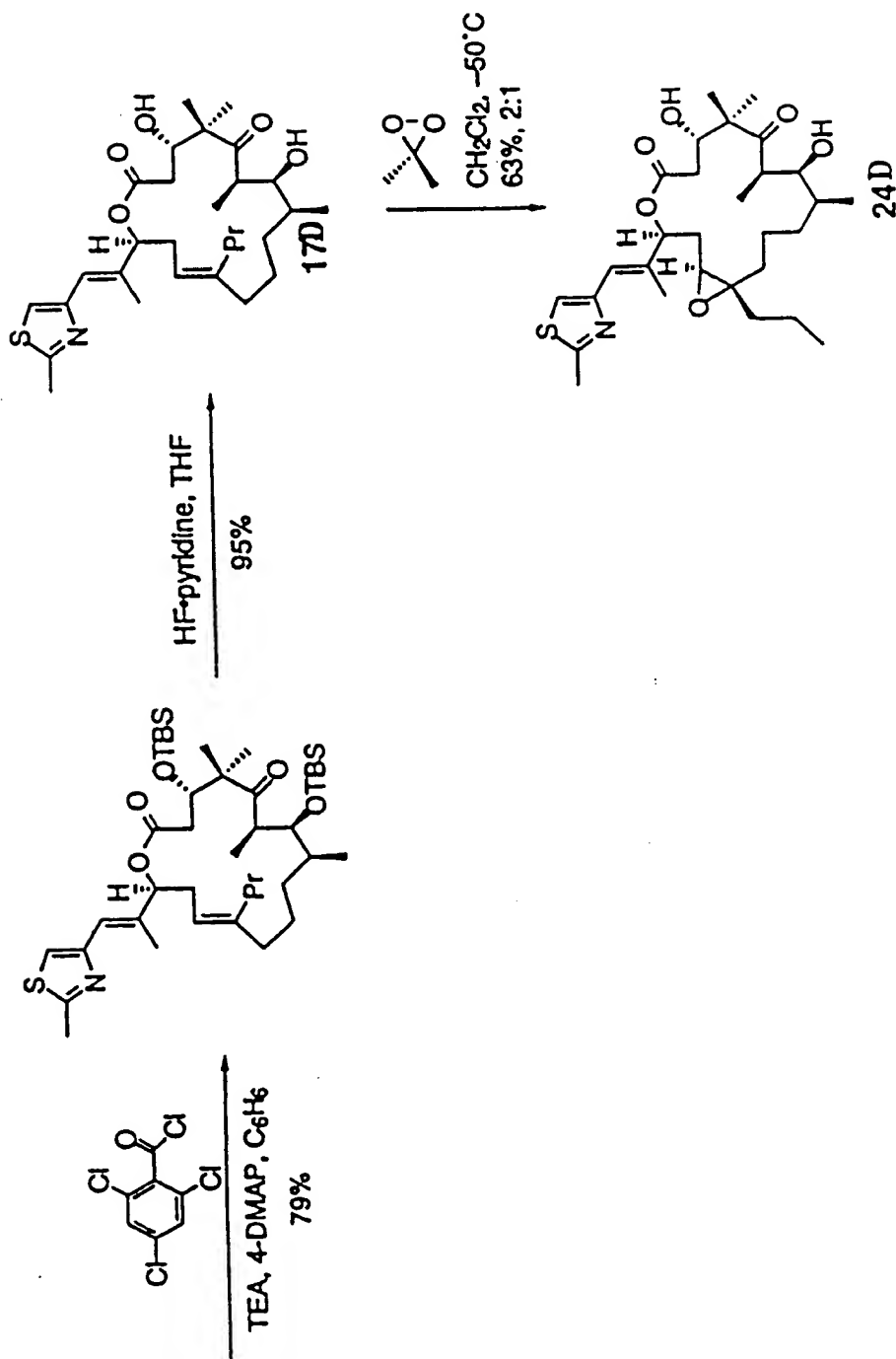
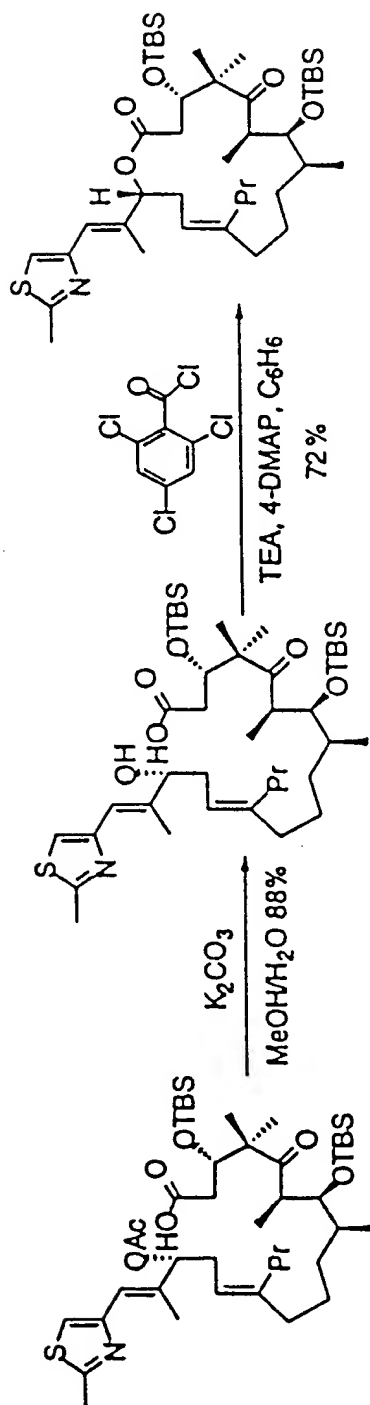


FIG. 24A



minor product from suzuki  
coupling reaction

FIG. 24B

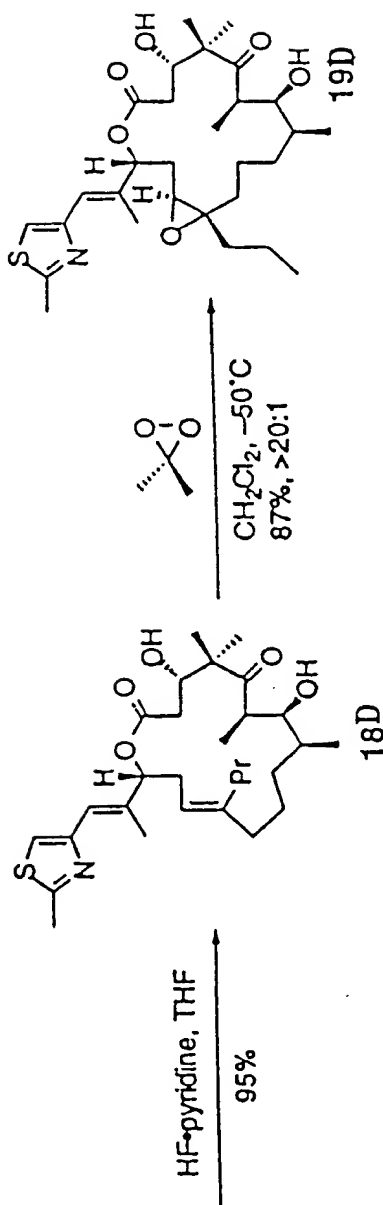


FIG. 25A

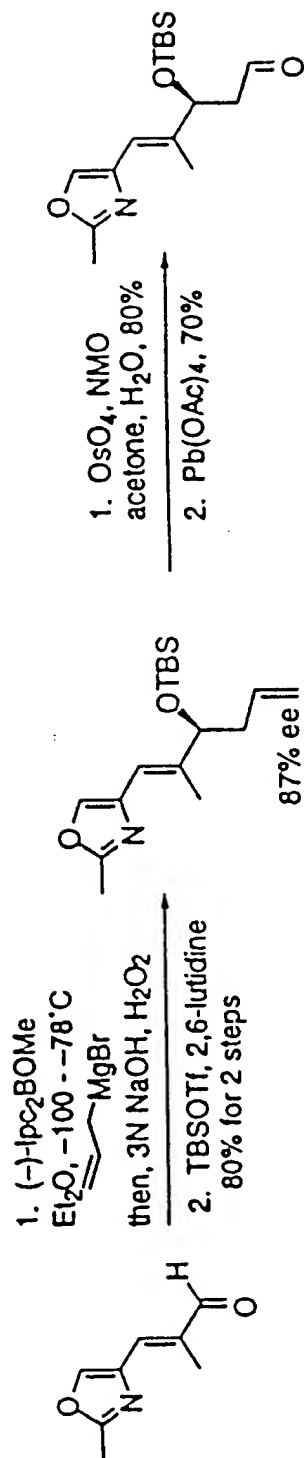


FIG. 25B

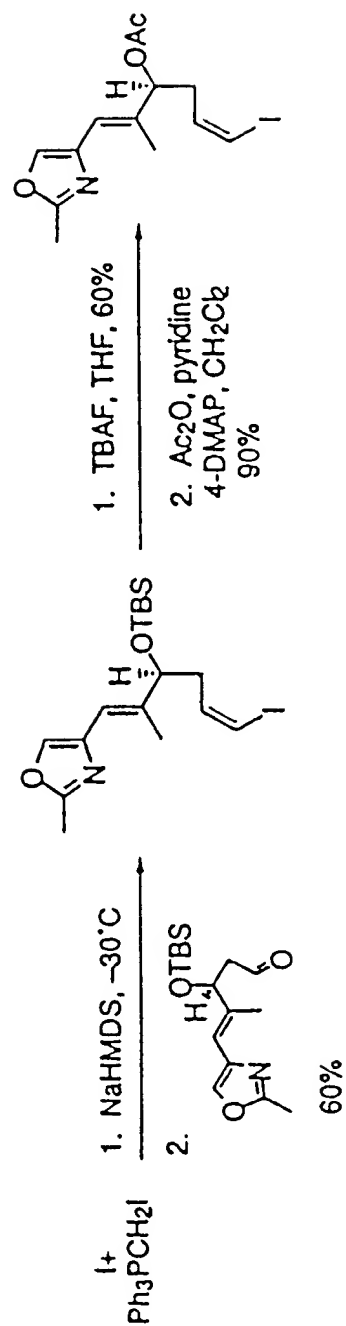


FIG. 25C

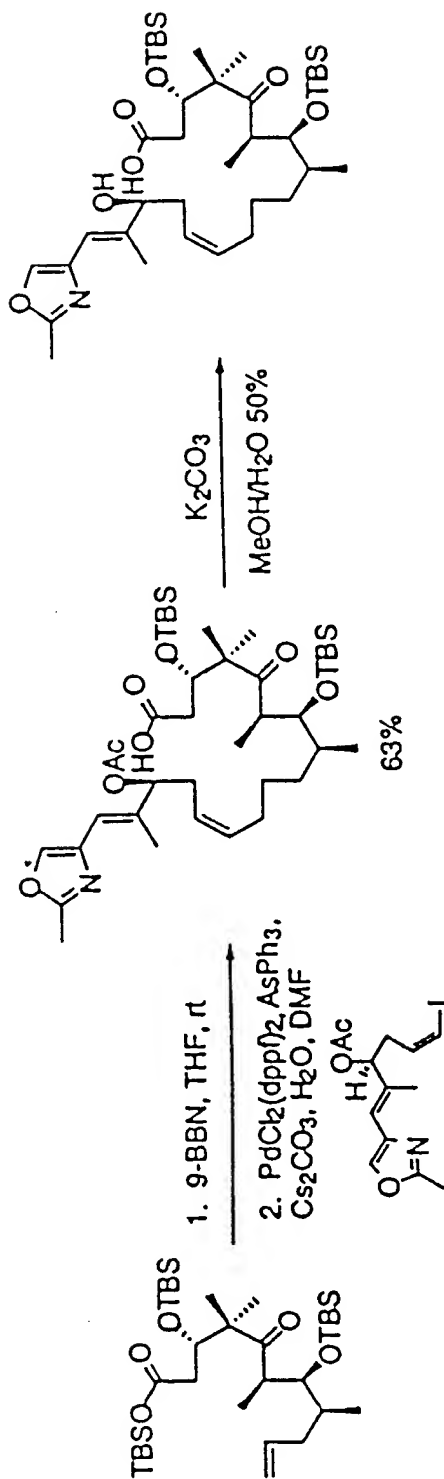


FIG. 25D

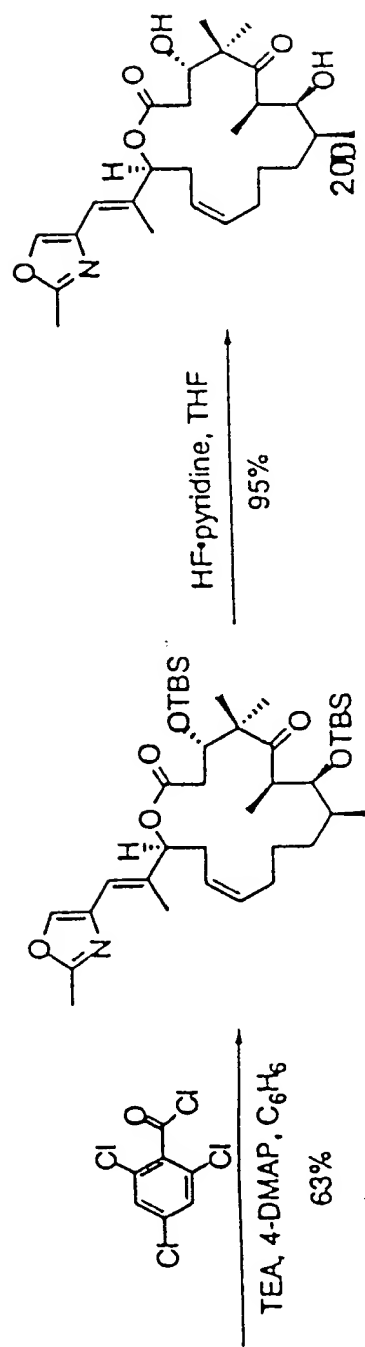


FIG. 26A

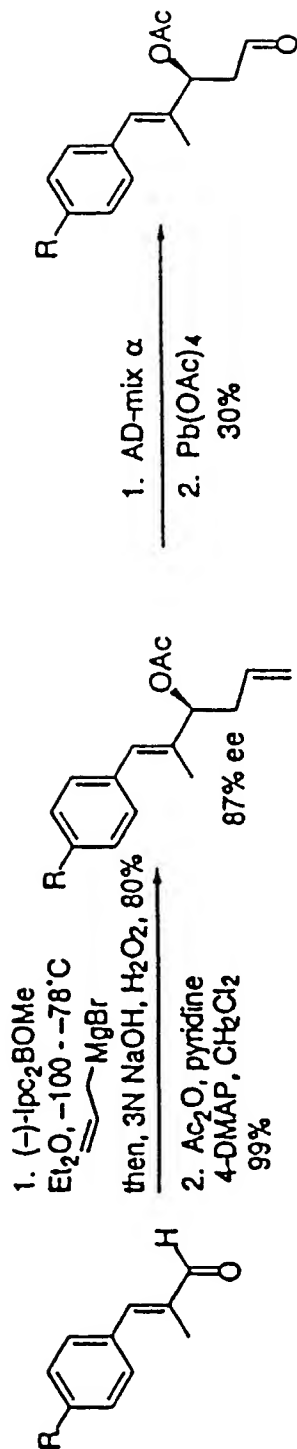
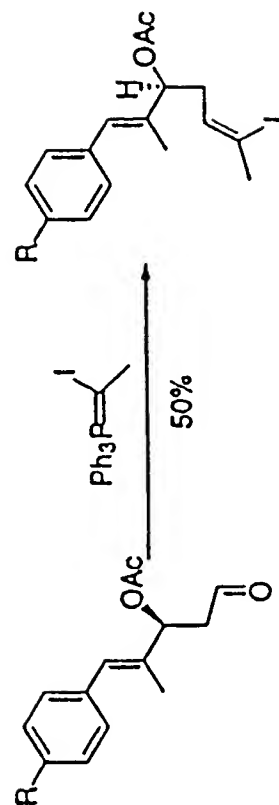


FIG. 26B



R = H, F,  $\text{CF}_3$   
R=H is the only compound completed, F and  $\text{CF}_3$  are nearly completed

FIG. 26C

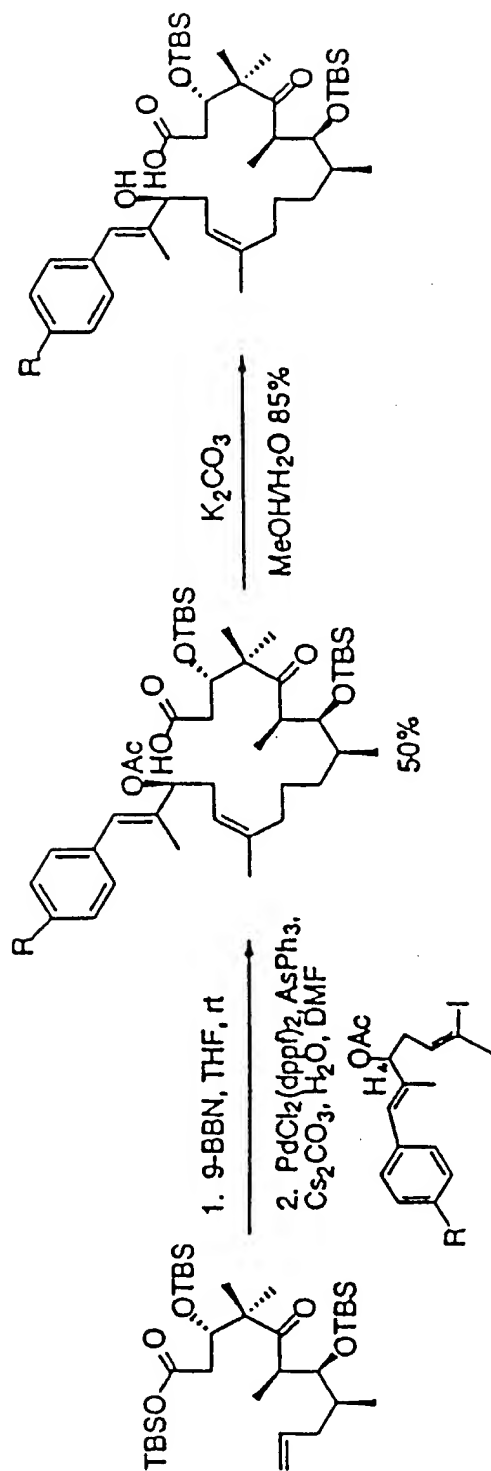


FIG. 26D

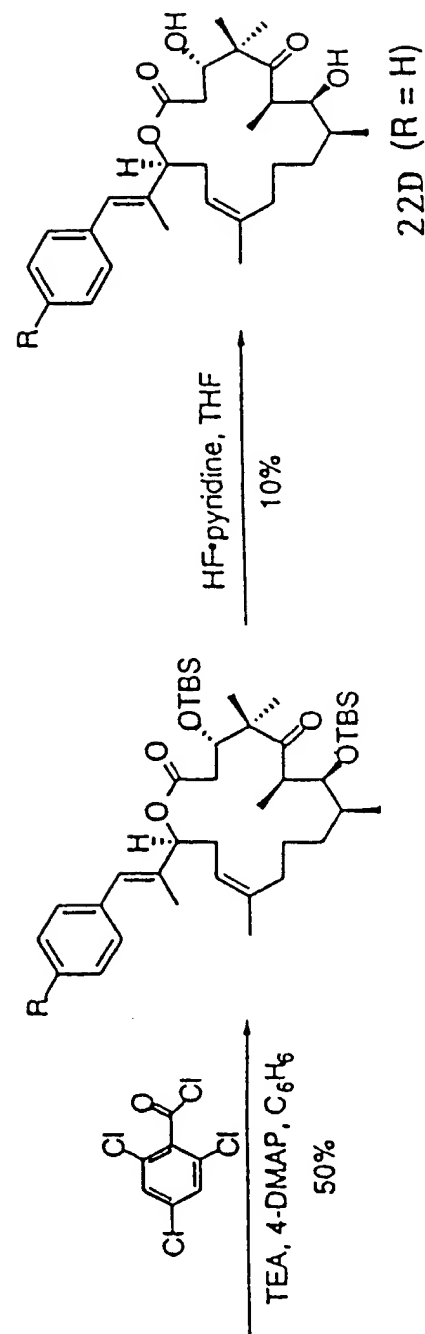


FIG. 27A

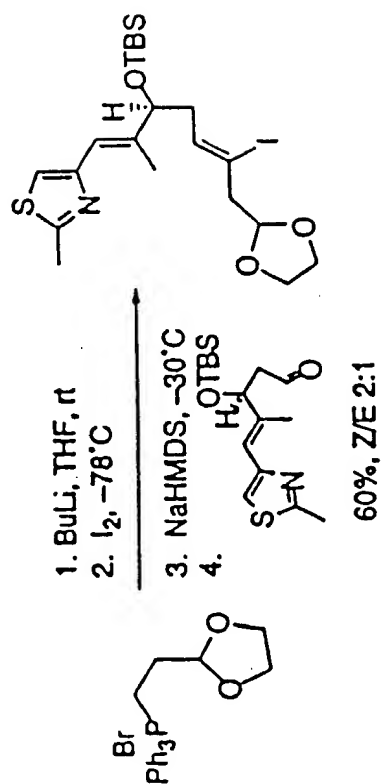


FIG. 27B

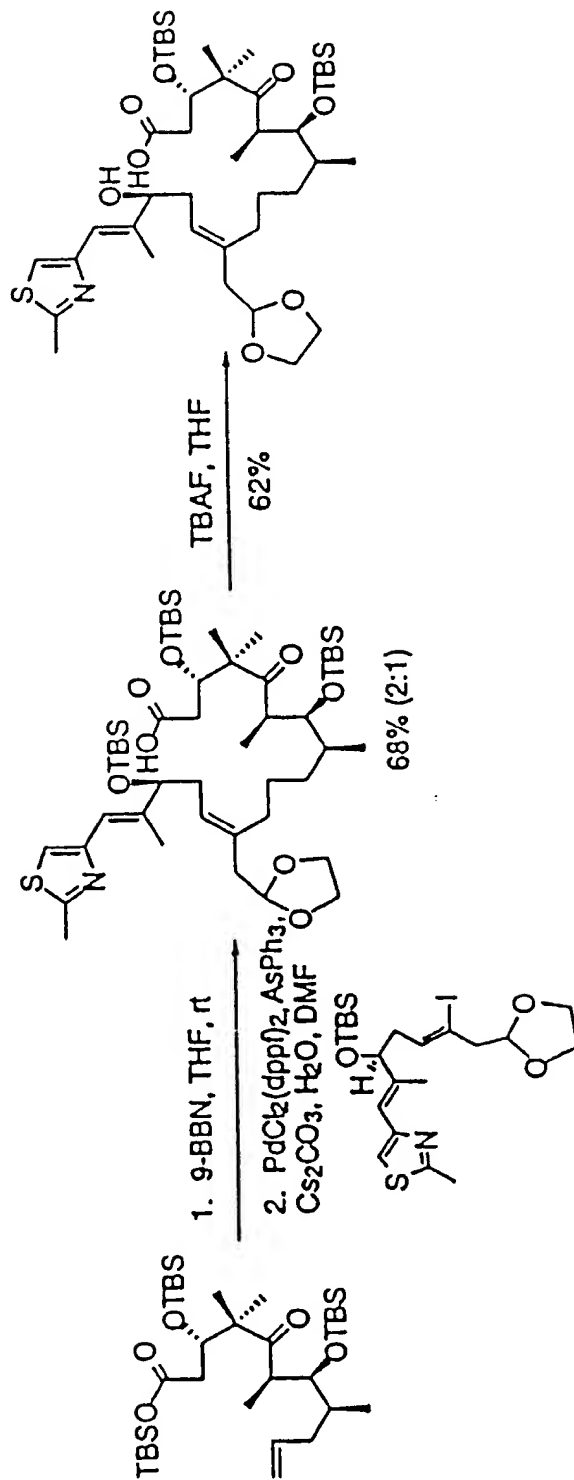
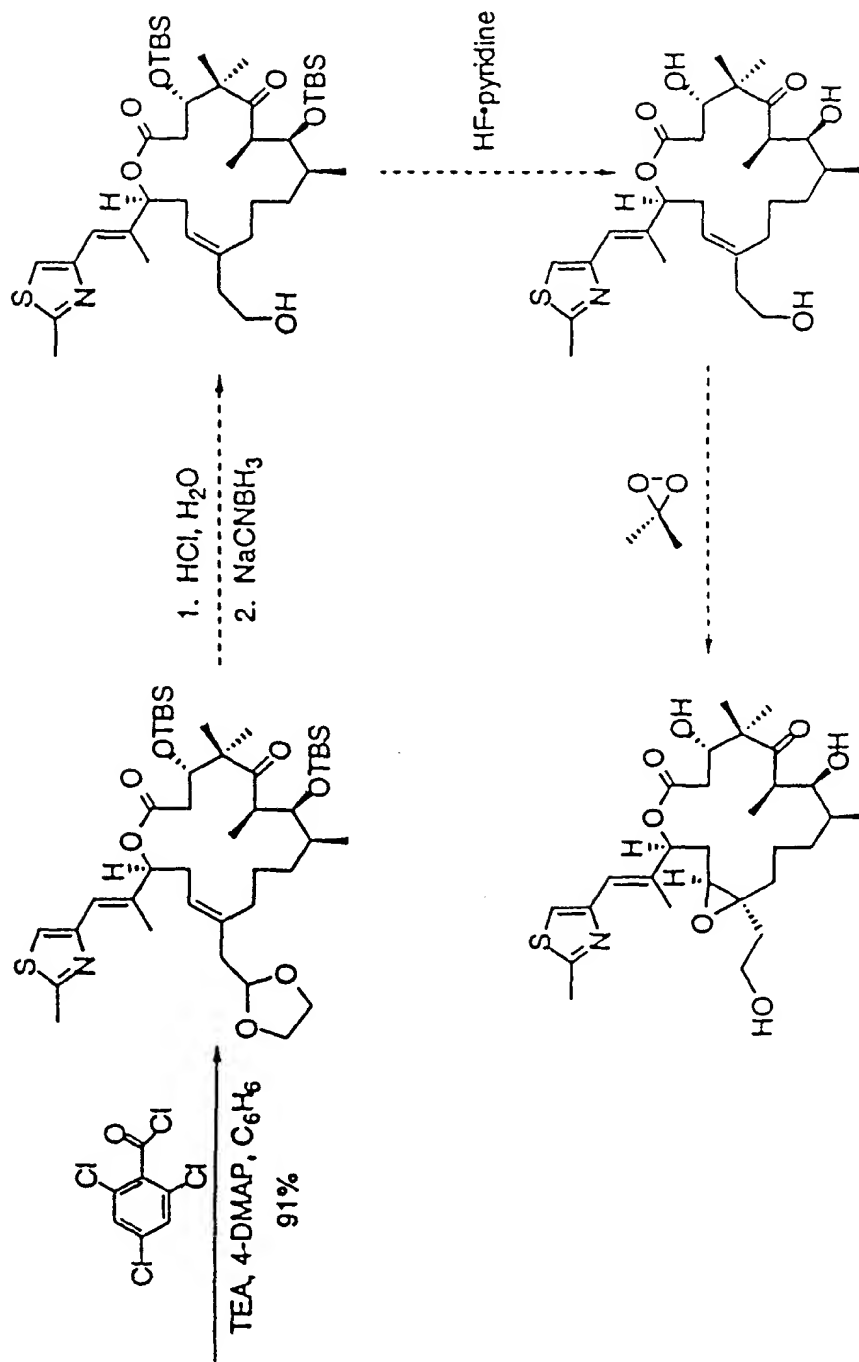


FIG. 27C

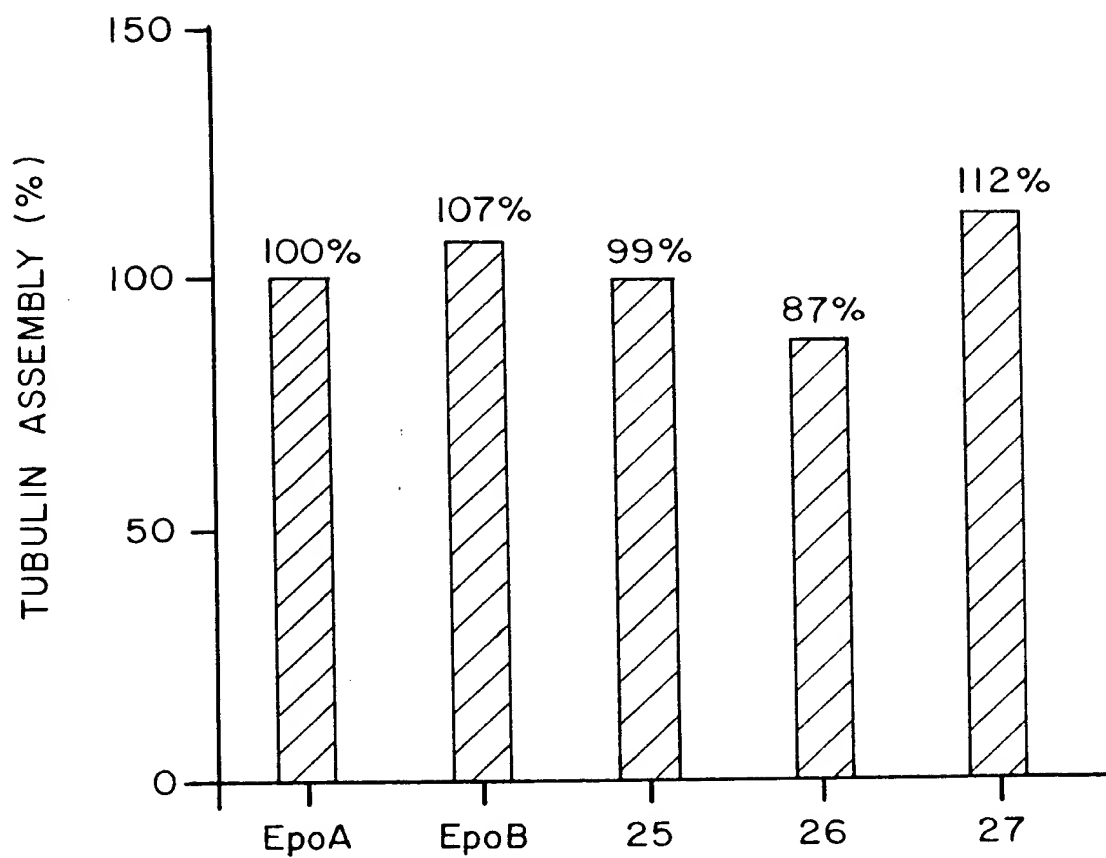






41/76

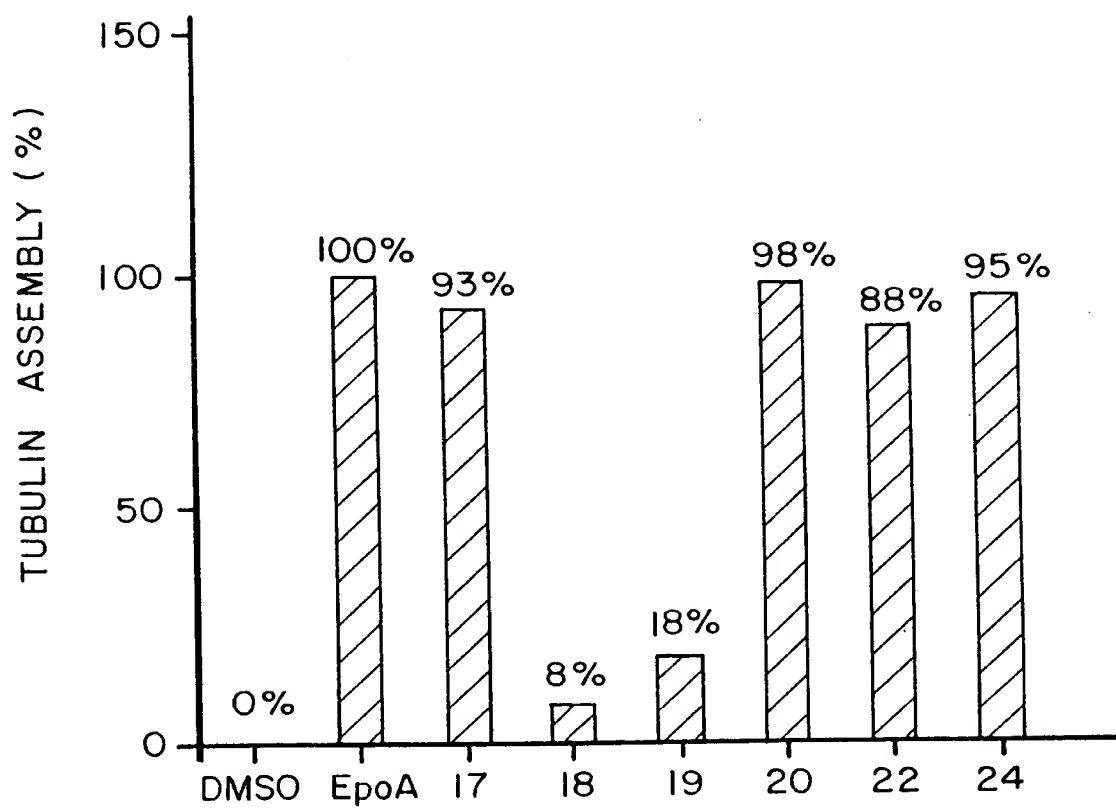
FIG. 28A





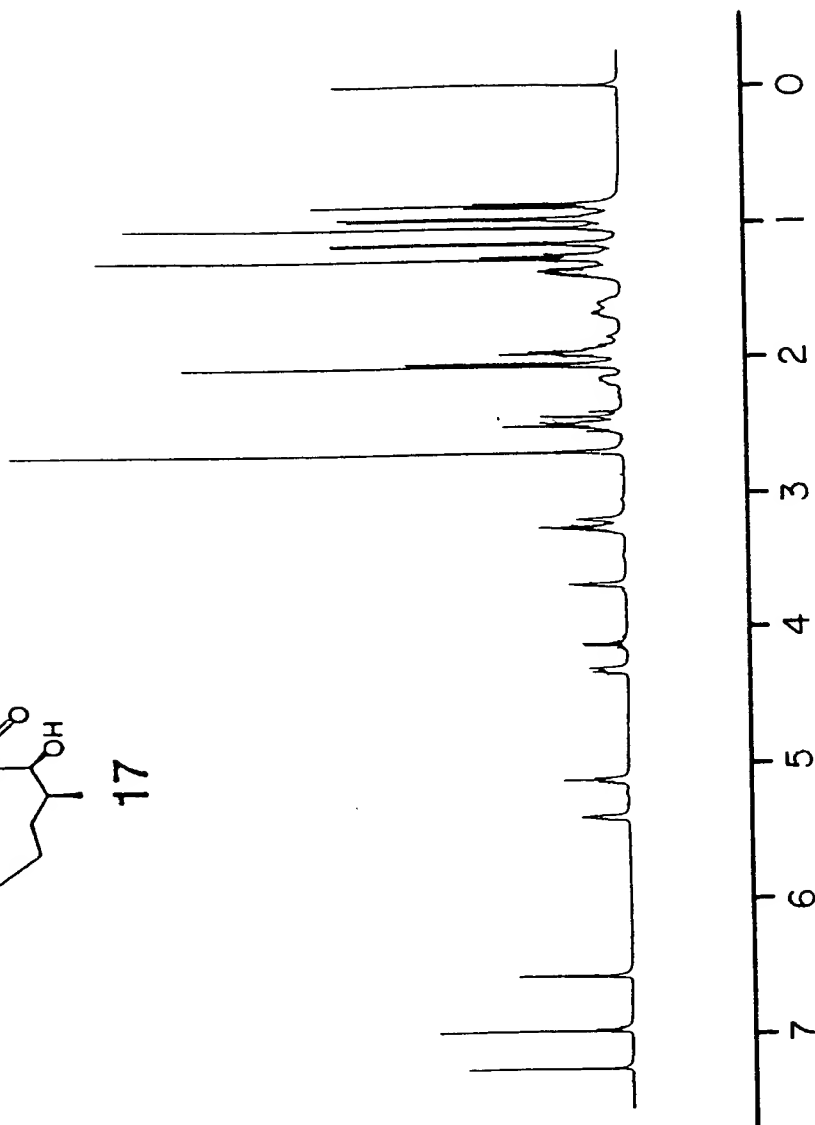
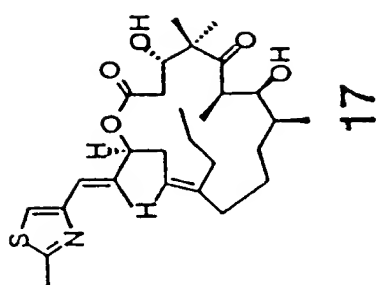
42/76

FIG. 28B





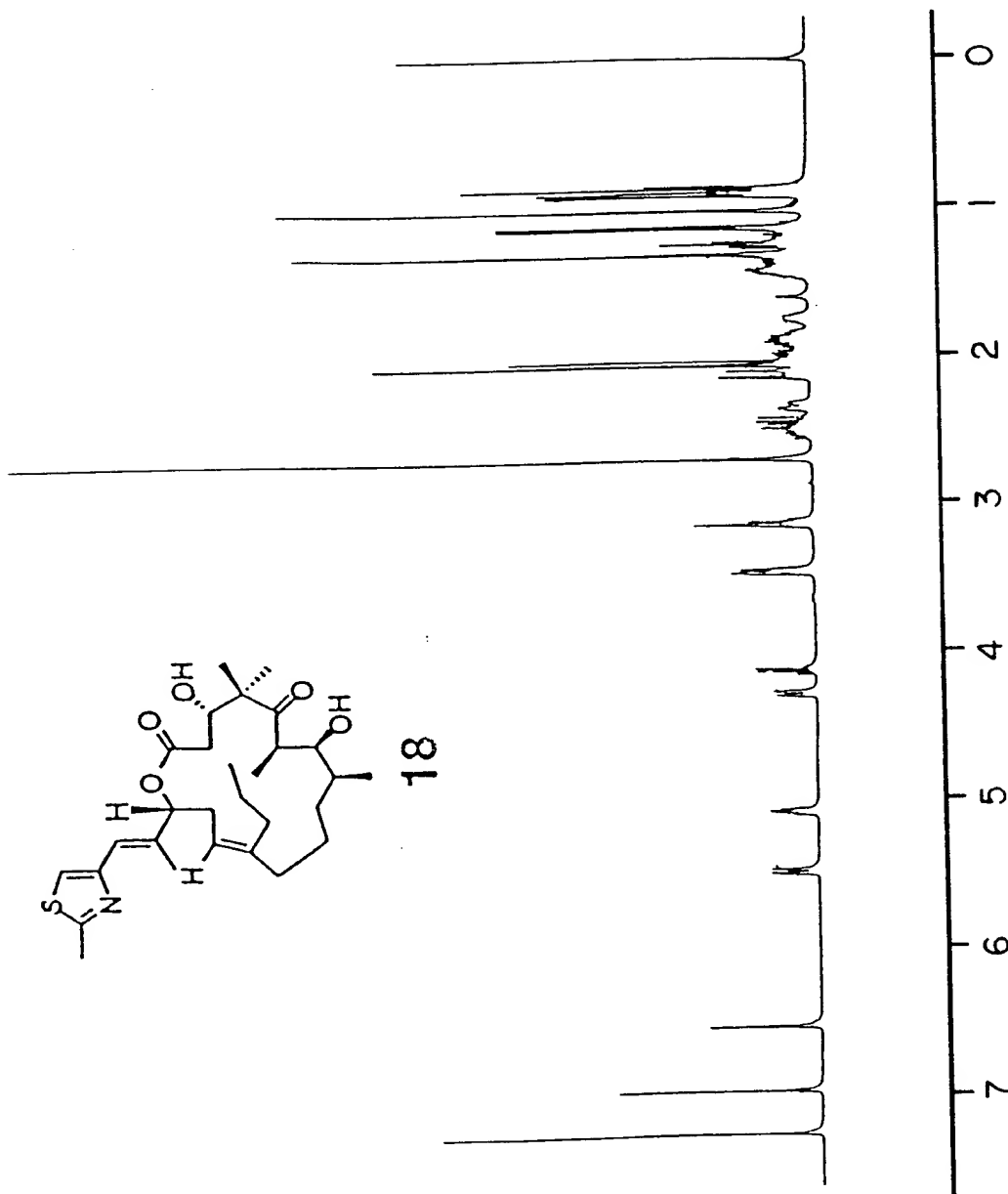
**FIG. 29**





44/76

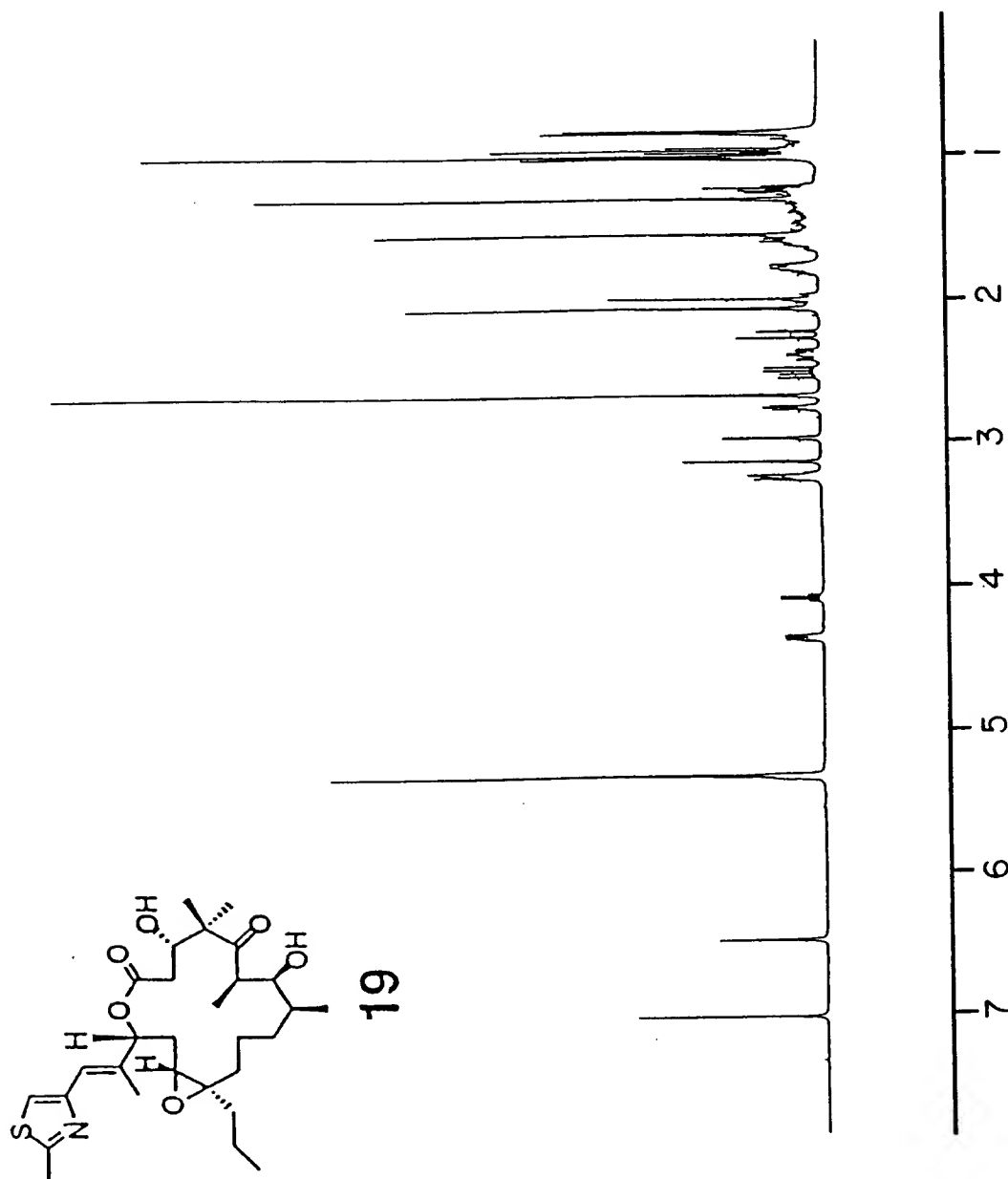
FIG. 30





45/76

FIG. 31



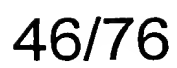
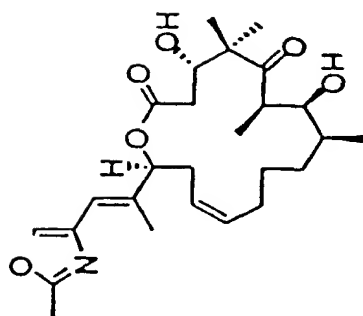
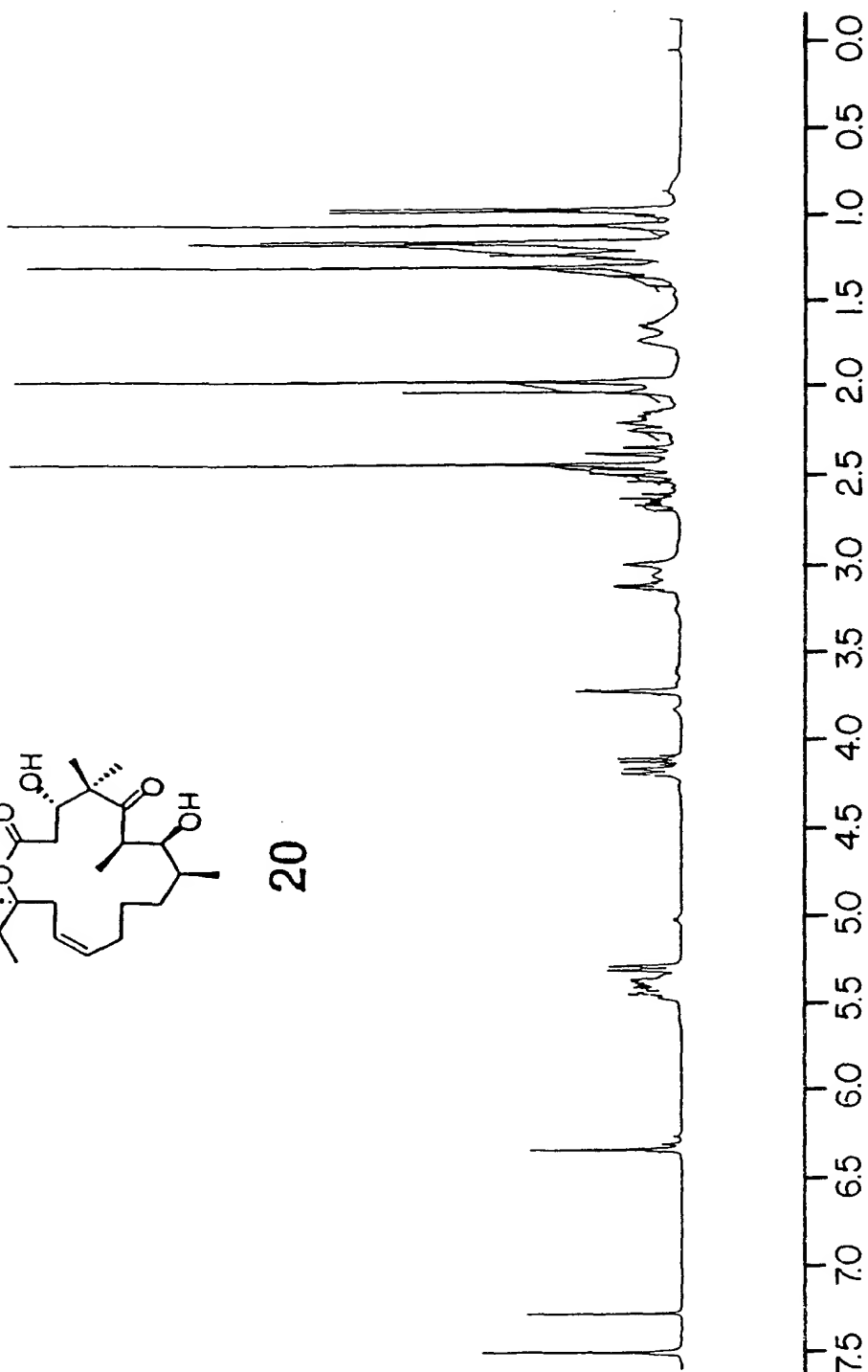


FIG. 32



20



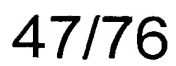
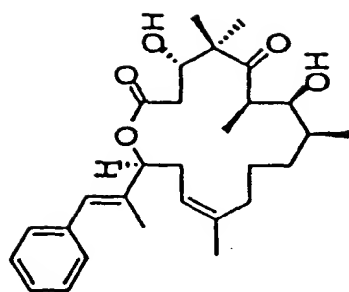
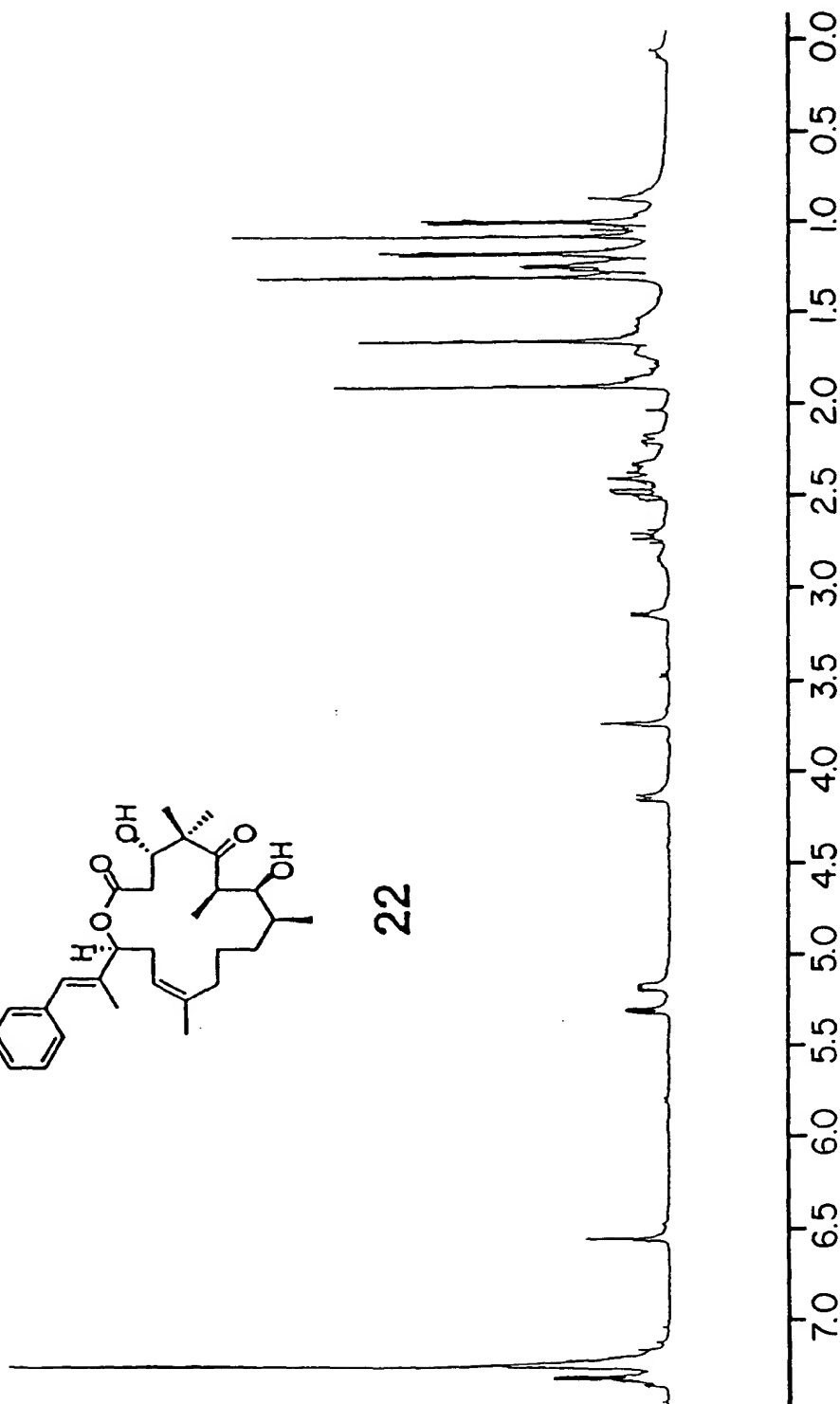


FIG. 33

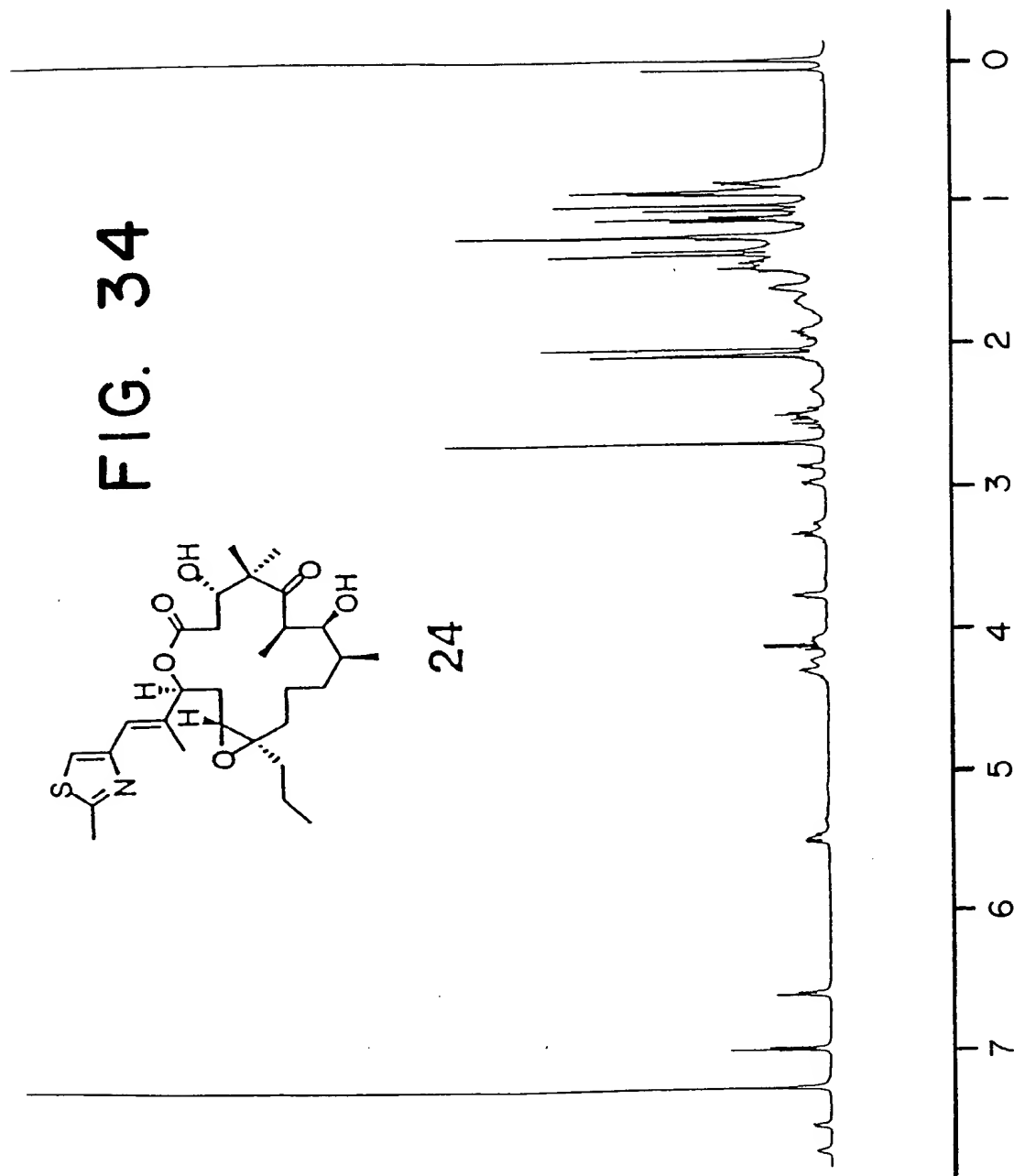


22





48/76

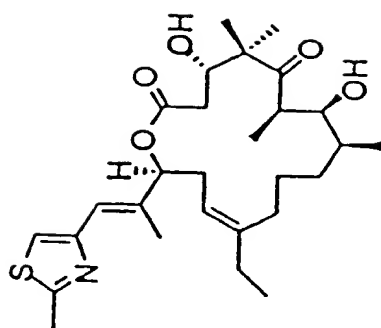




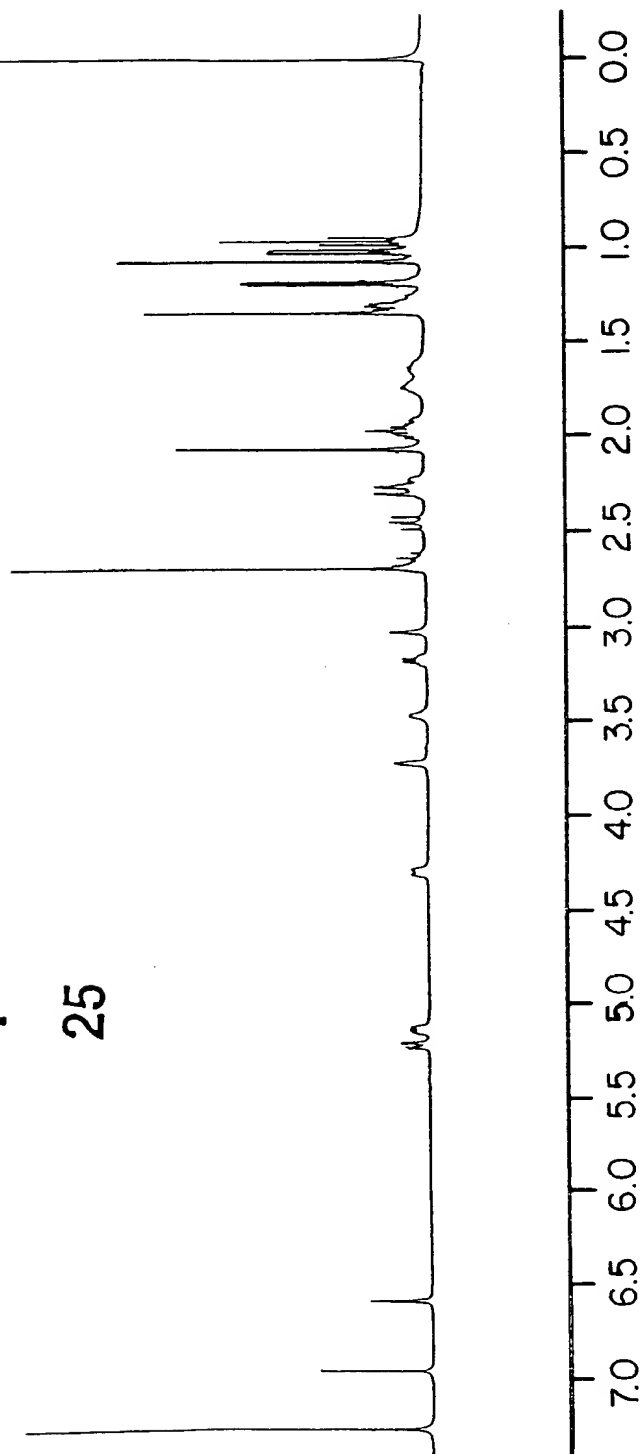


49/76

FIG. 35



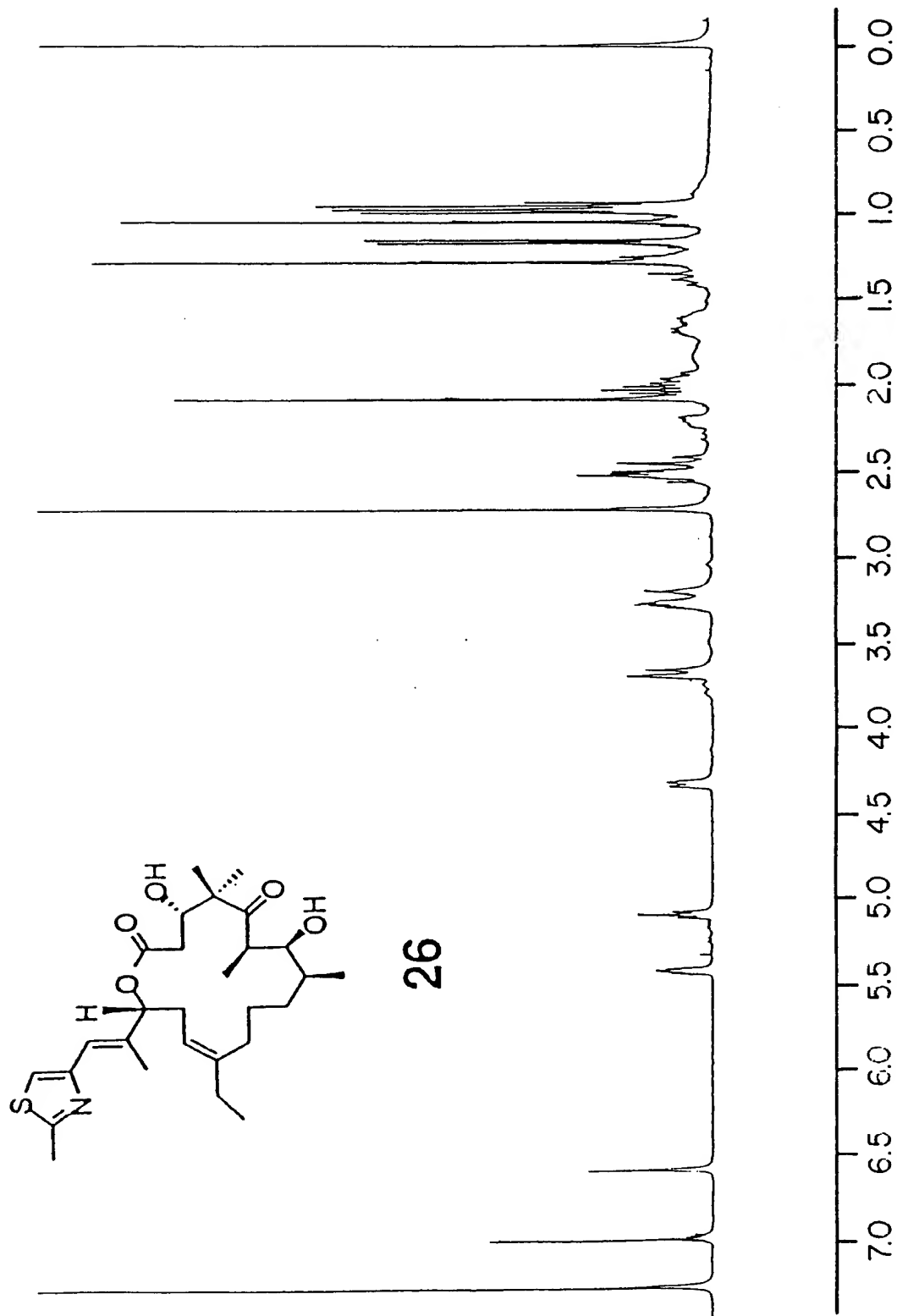
25





50/76

FIG. 36

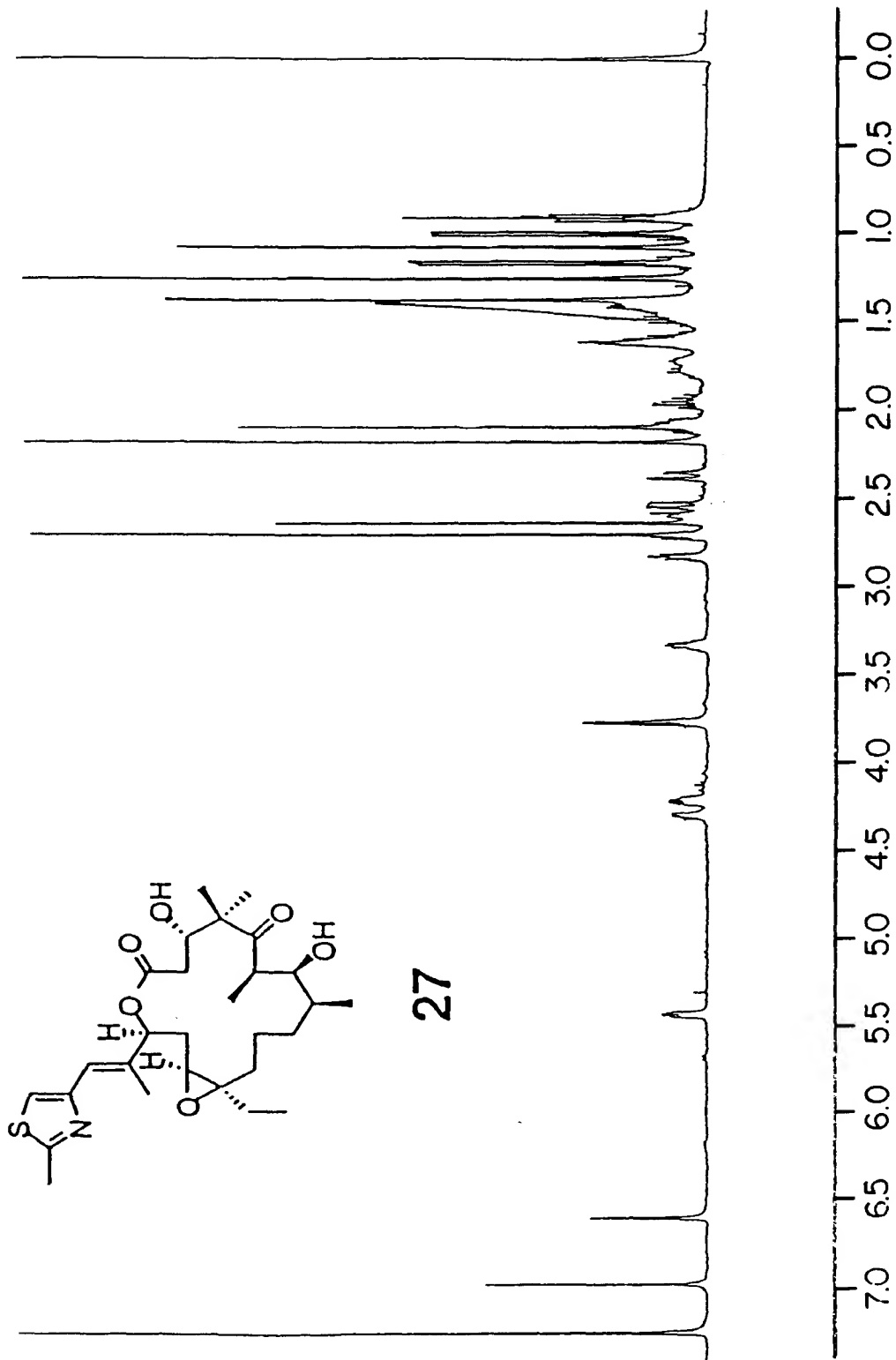


26



51/76

FIG. 37





52/76

FIG. 38

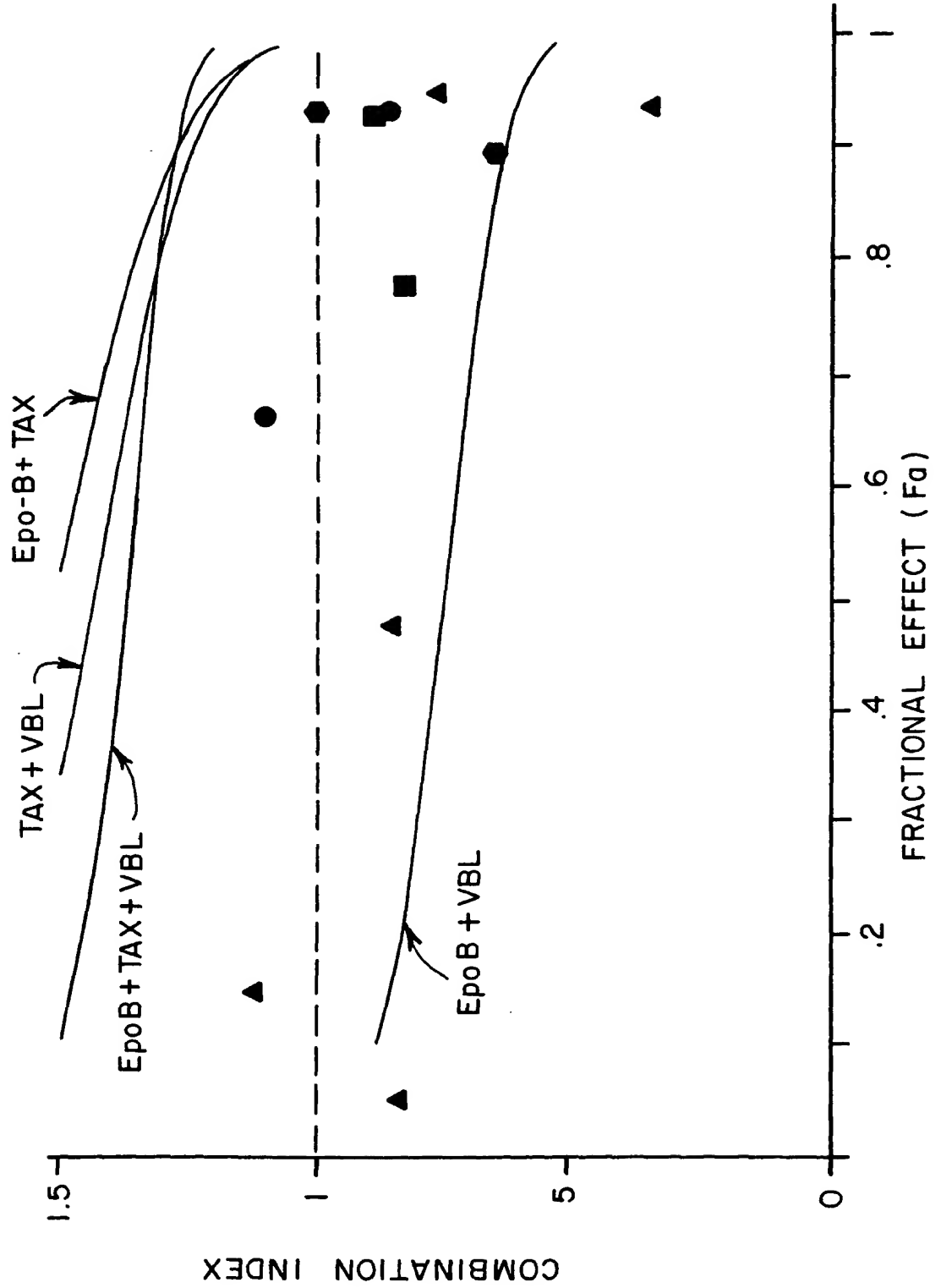
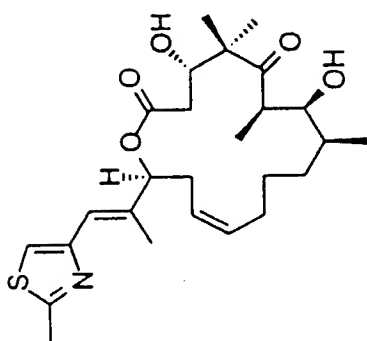
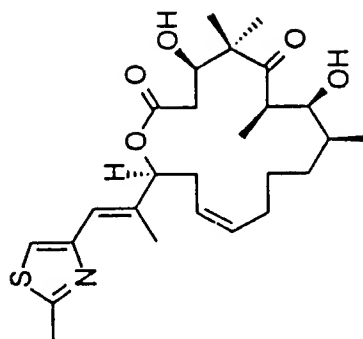


FIG. 39A

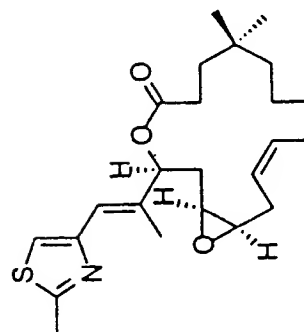


desoxyepothilone A

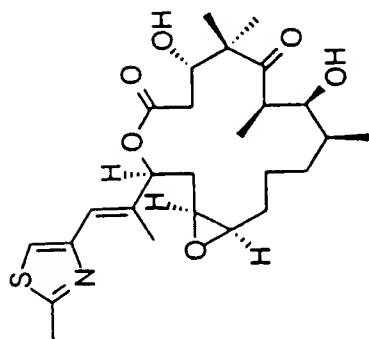
**1**  
(0.022)  
[0.012]



**4**  
(2.12)  
[43.0]

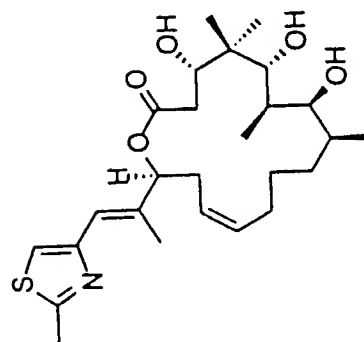


**3**  
(271.1)  
[22.4]



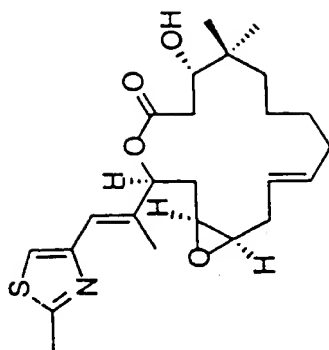
epothilone A

(0.0027)  
[0.020]

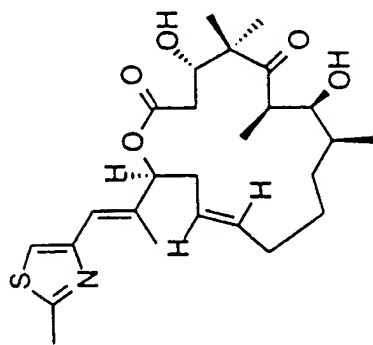


**2**  
(14.23)  
[6.28]

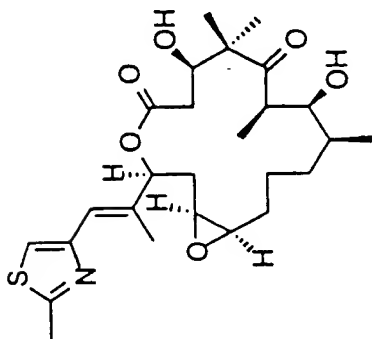
FIG. 39B



7  
(7.36)  
[9.82]

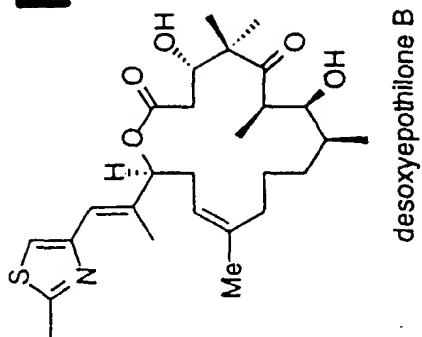


6  
(0.052)  
[0.035]

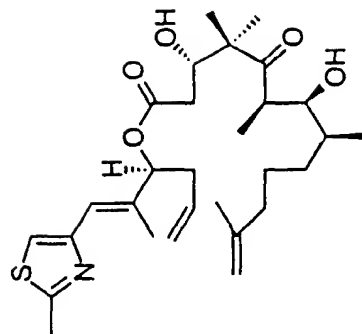


5  
(>20)  
[35.2]

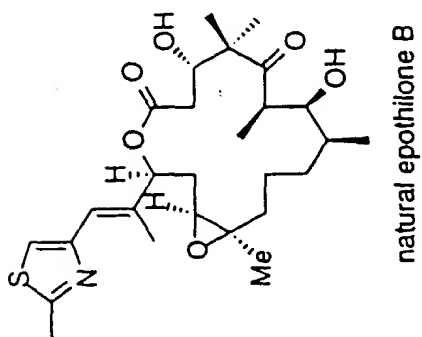
FIG. 40A



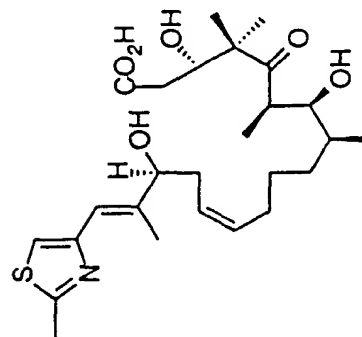
**10**  
(0.0095)  
[0.017]



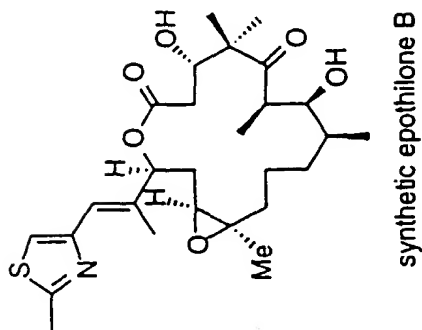
**13**  
(11.53)  
[5.63]



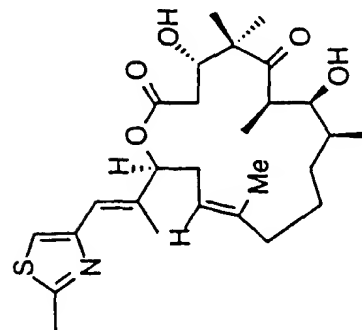
**9**  
(0.00017)  
[0.0012]



**12**  
(0.79)  
[>5]



**8**  
(0.00044)  
[0.0026]



**11**  
(0.090)  
[0.262]

FIG. 40B

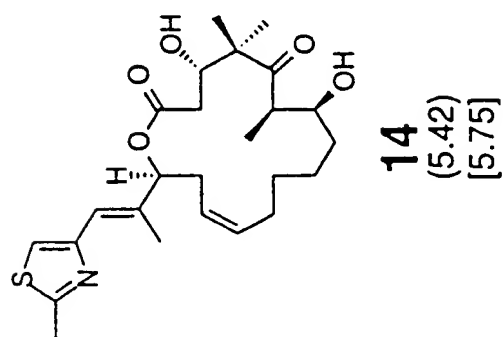
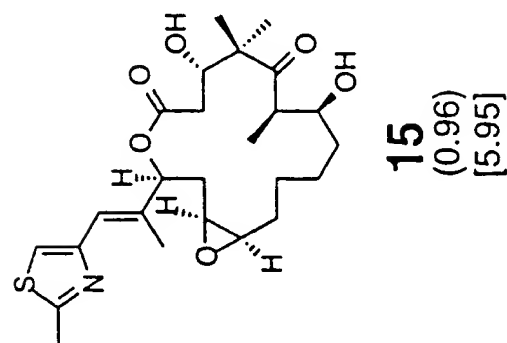
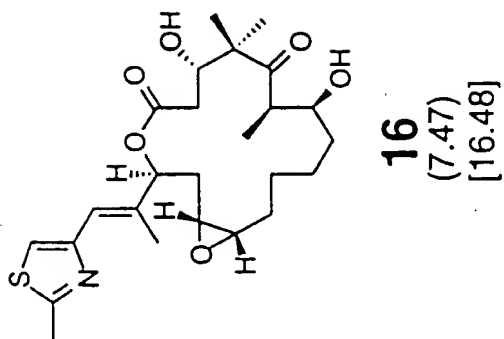
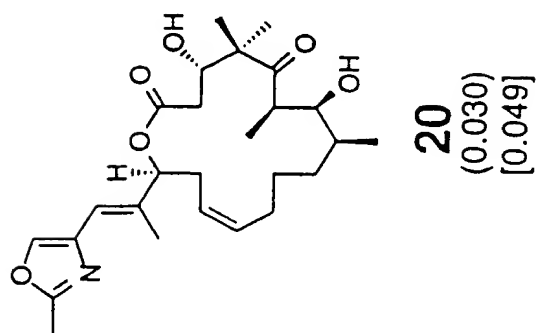
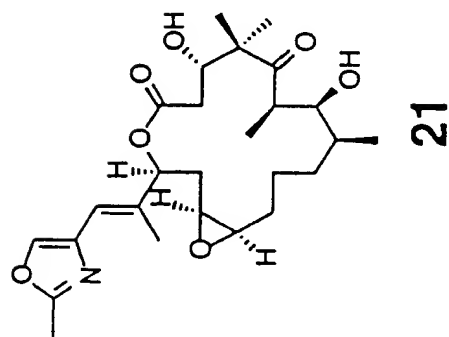
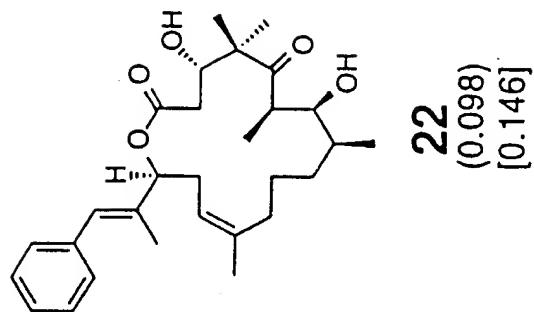
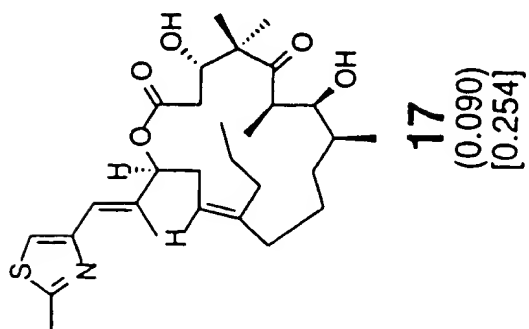
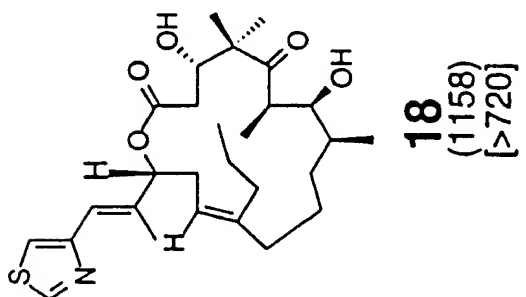
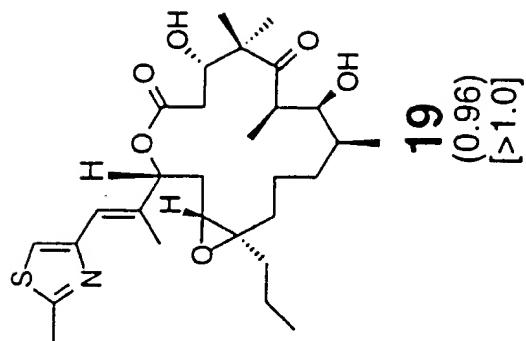




FIG. 41A





58/76

FIG. 41B

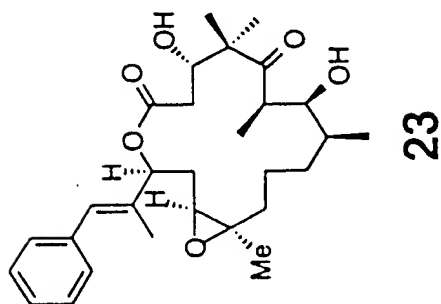
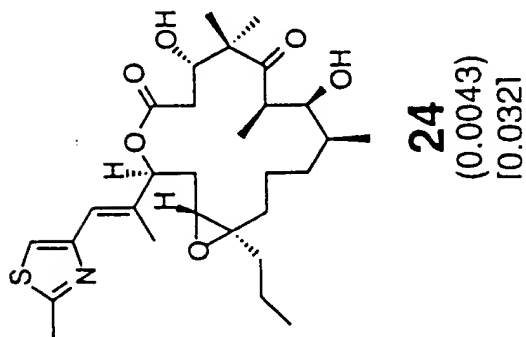
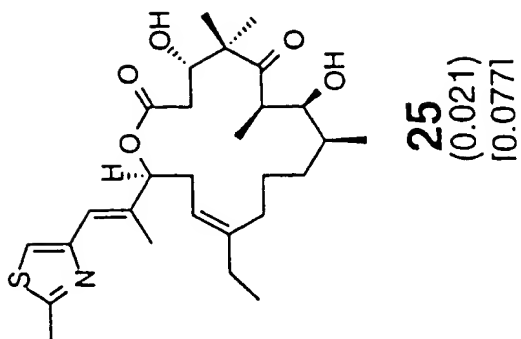
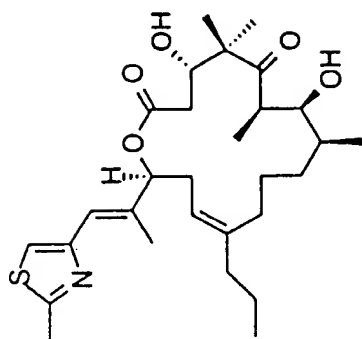
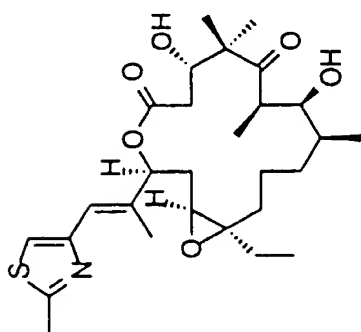


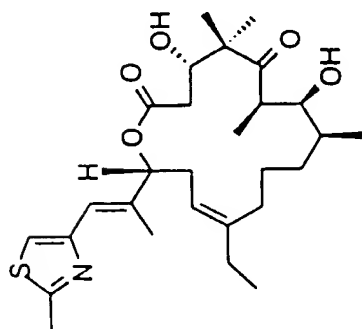
FIG. 42A



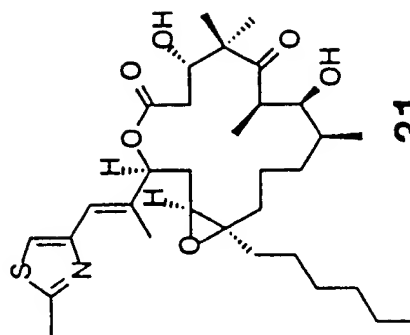
**28**  
(0.039)  
[0.067]



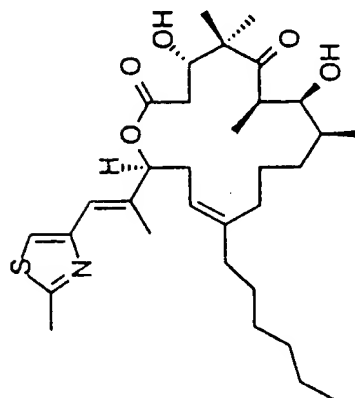
**27**  
(0.0010)  
[0.0072]



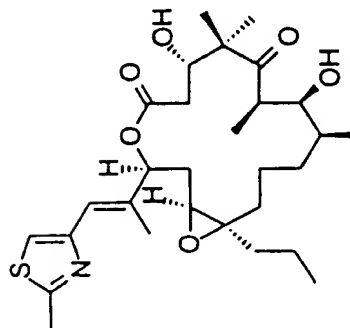
**26**  
(0.055)  
[0.197]



**31**  
(0.027)  
[0.049]

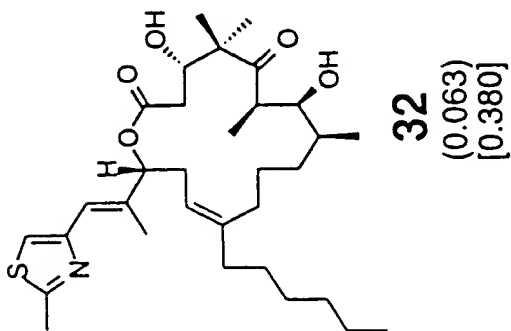
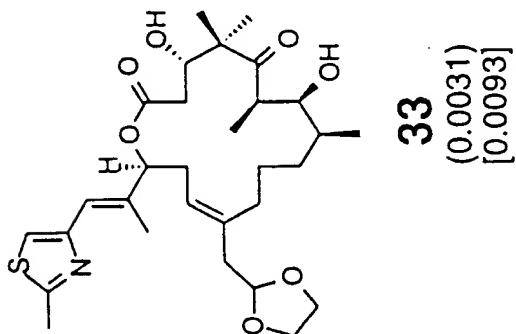
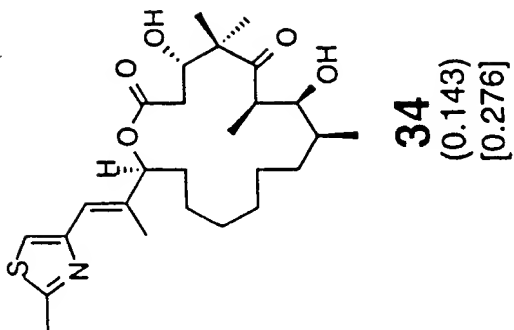


**30**  
(0.044)  
[0.108]



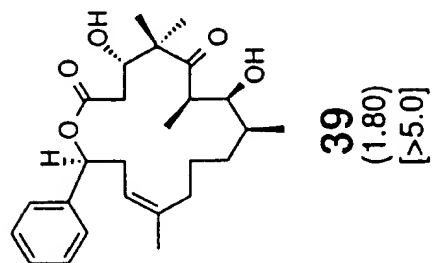
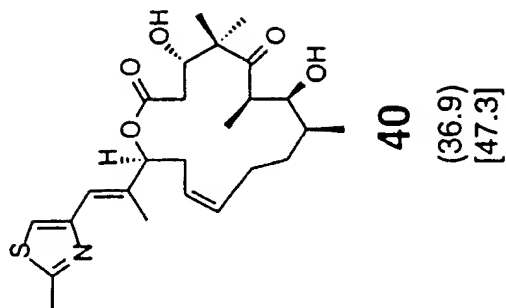
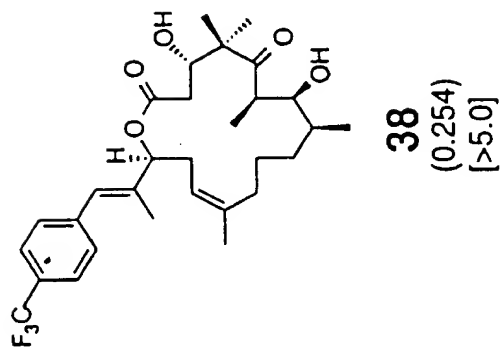
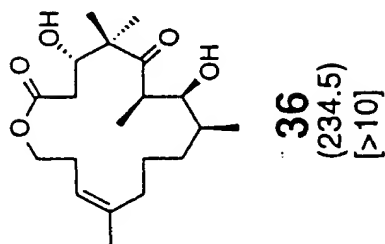
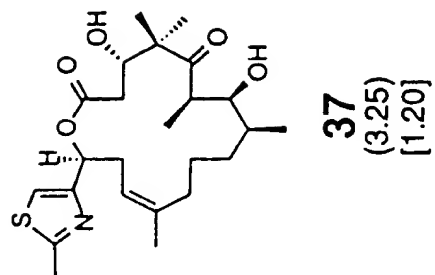
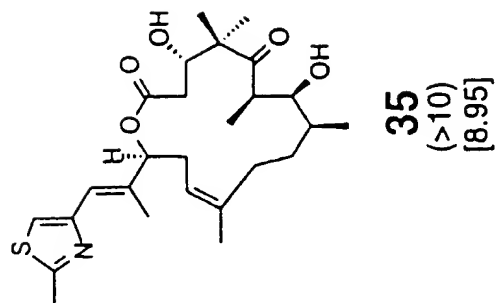
**29**  
(0.0038)  
[0.0064]

FIG. 42B



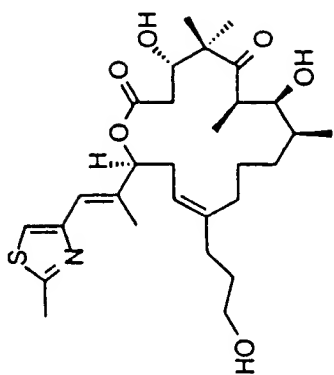
61/76

FIG. 42C

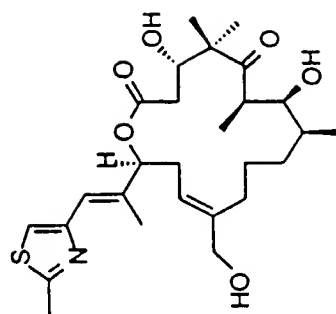


62/76

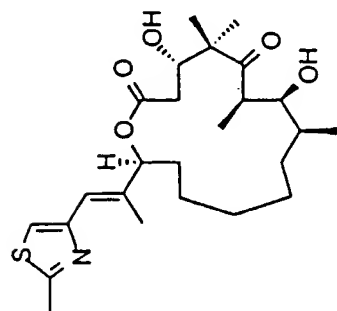
FIG. 42D



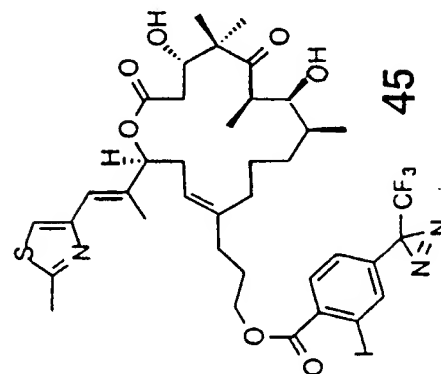
43  
 (0.0095)  
 [0.167]



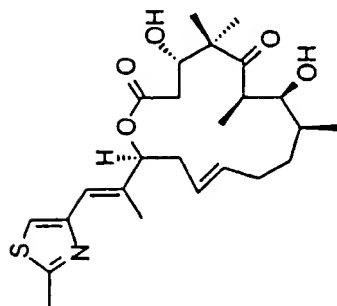
46 (0.049)  
 [>1.0]



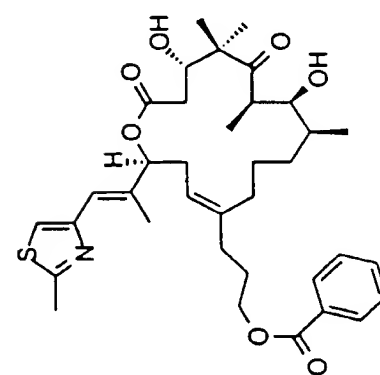
42  
 (7.41)  
 [12.9]



45

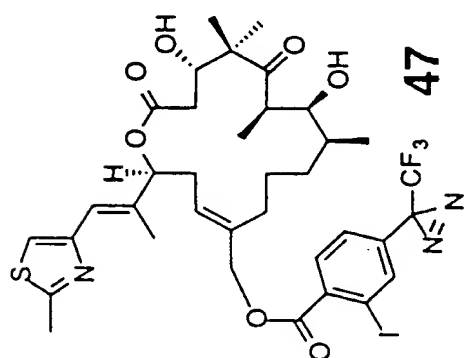
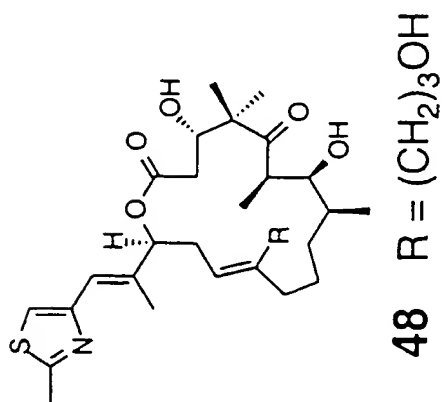
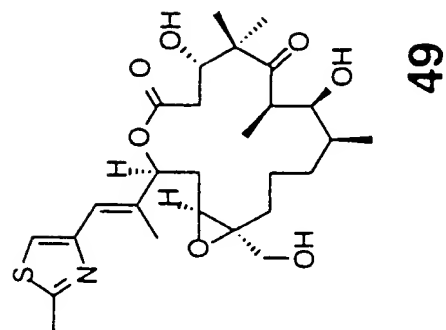


41  
 (60.1)  
 [59.2]



44 (0.250)  
 [0.905]

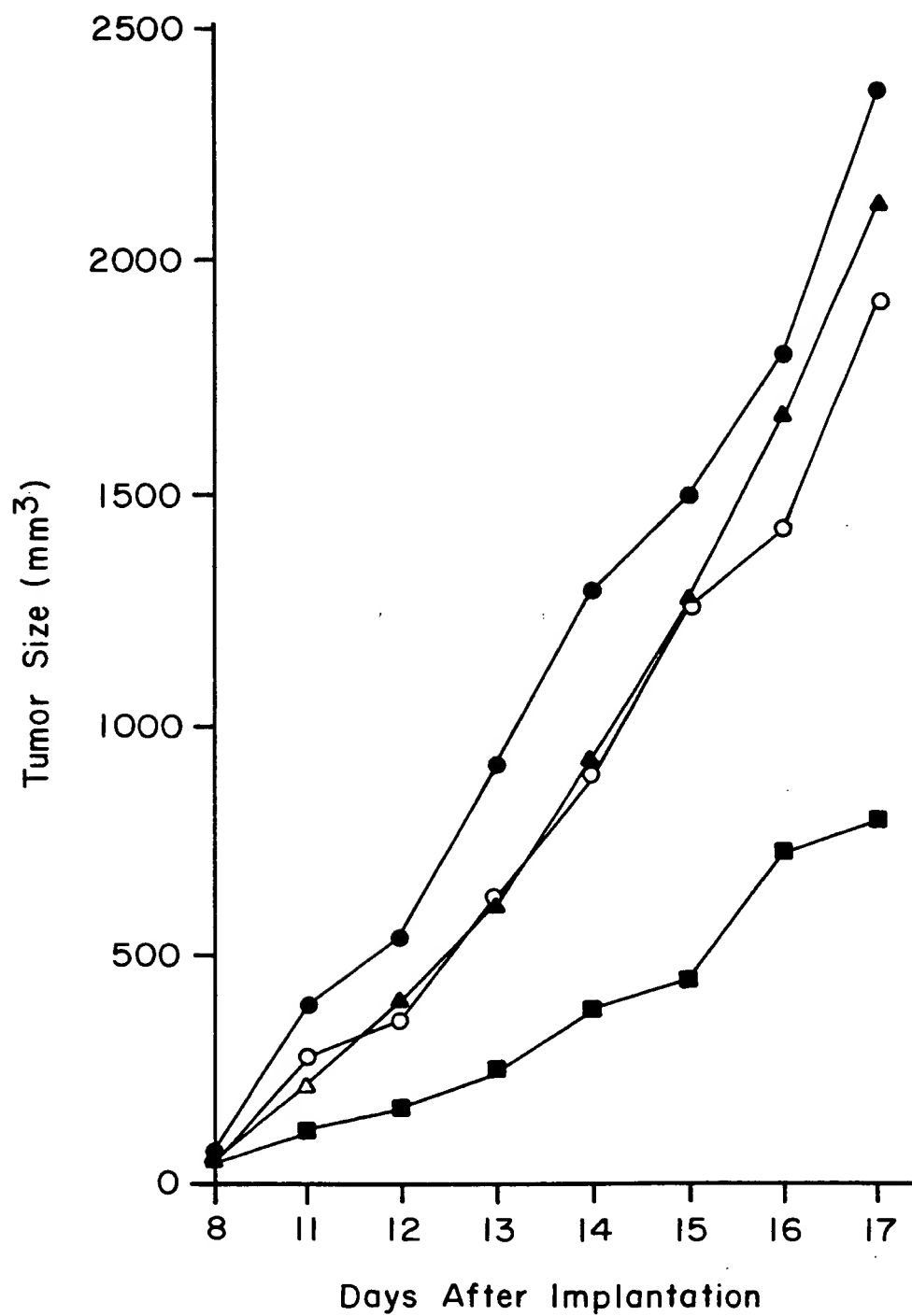
FIG. 42E





64/76

FIG. 43A

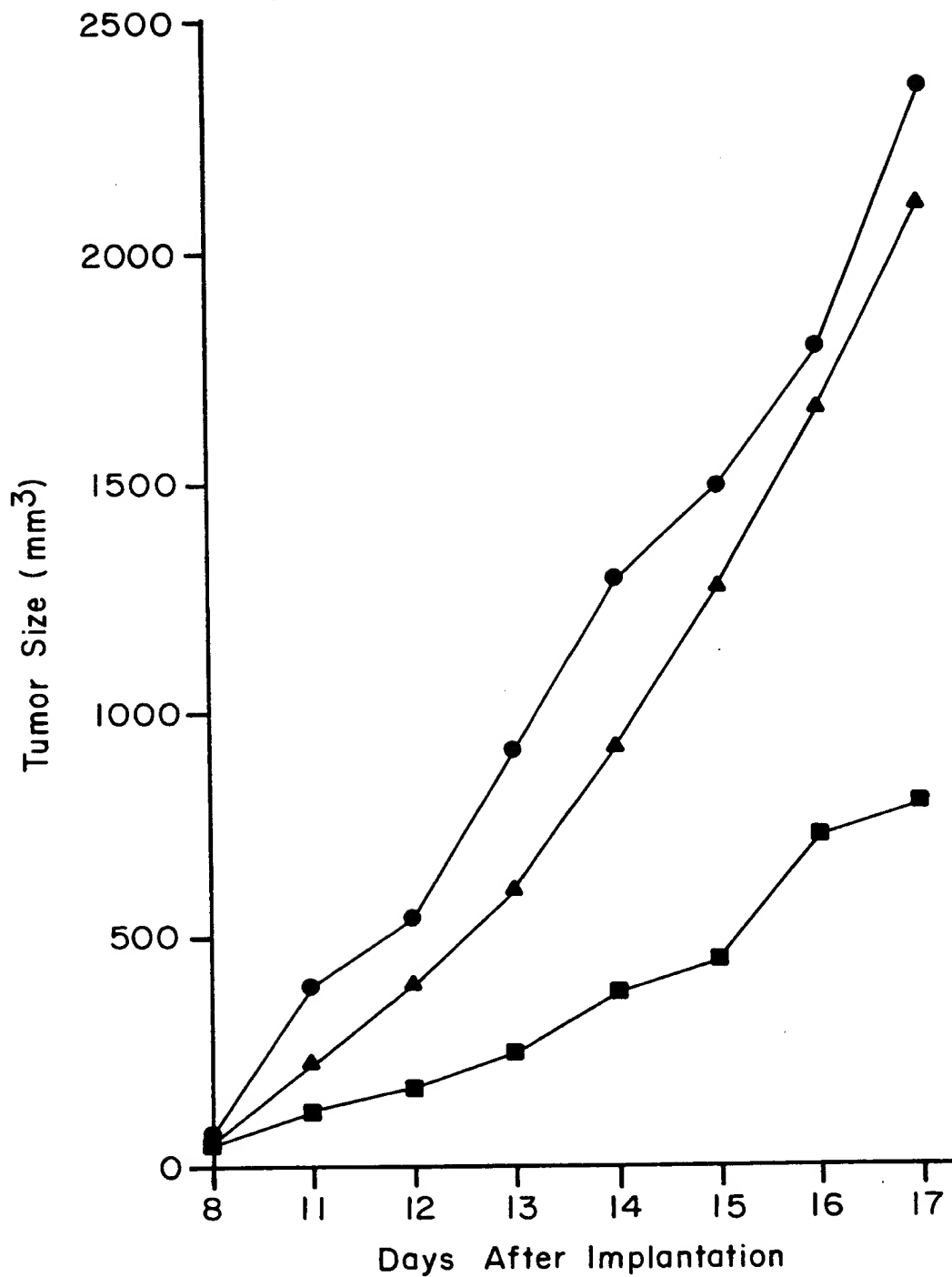






65/76

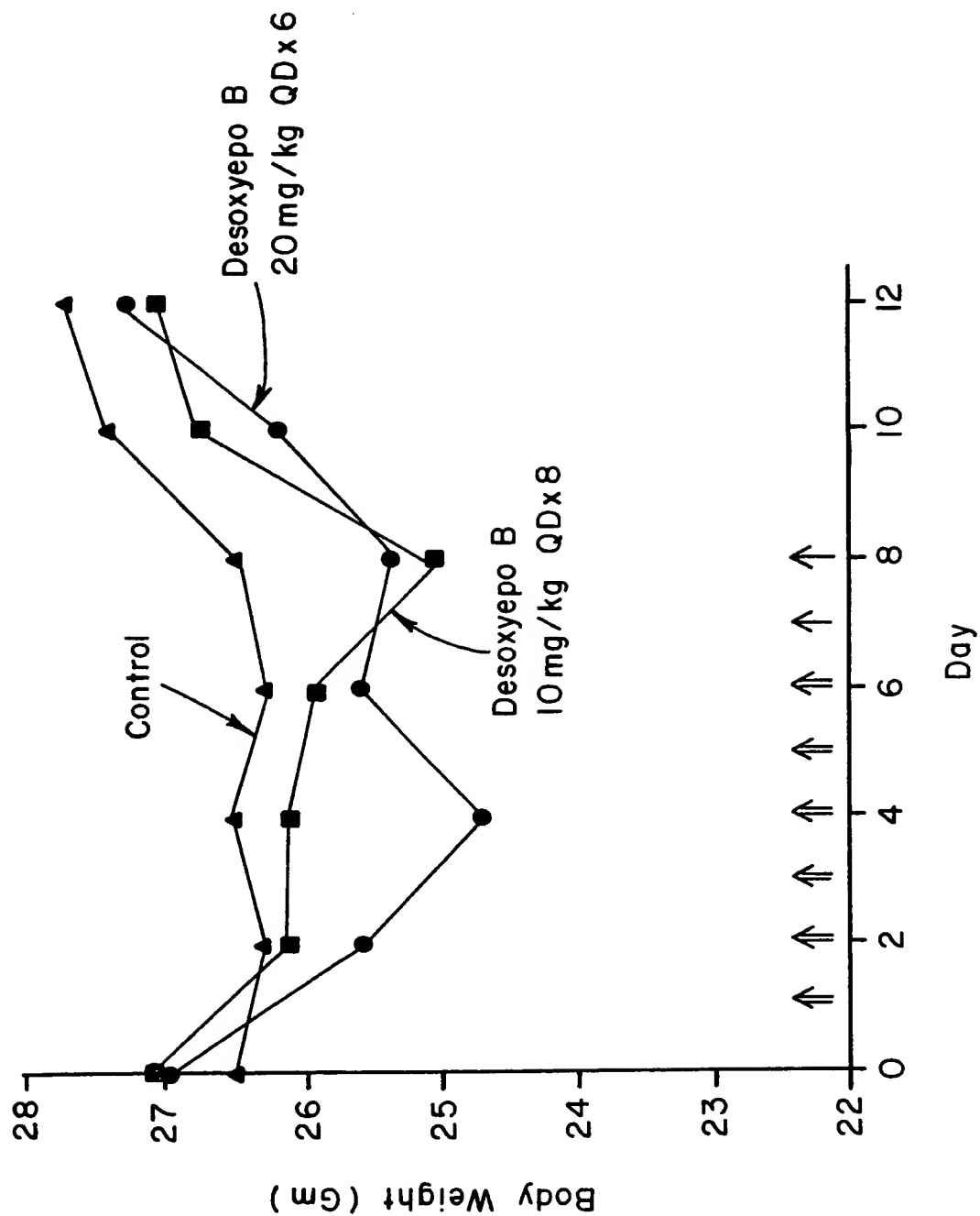
FIG. 43 B

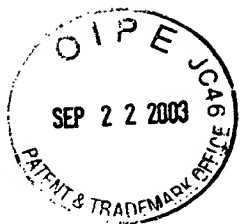




66/76

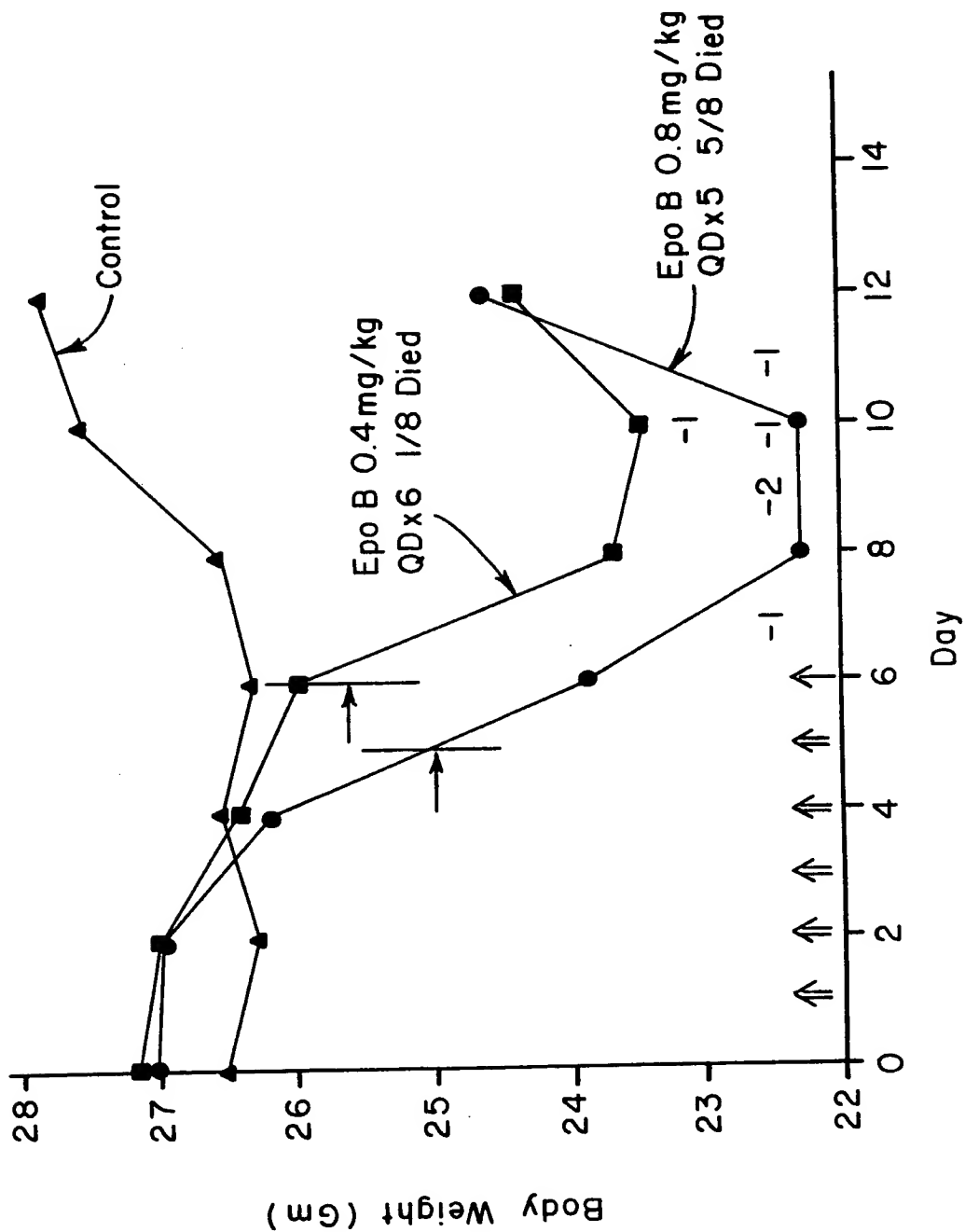
FIG. 44A





67/76

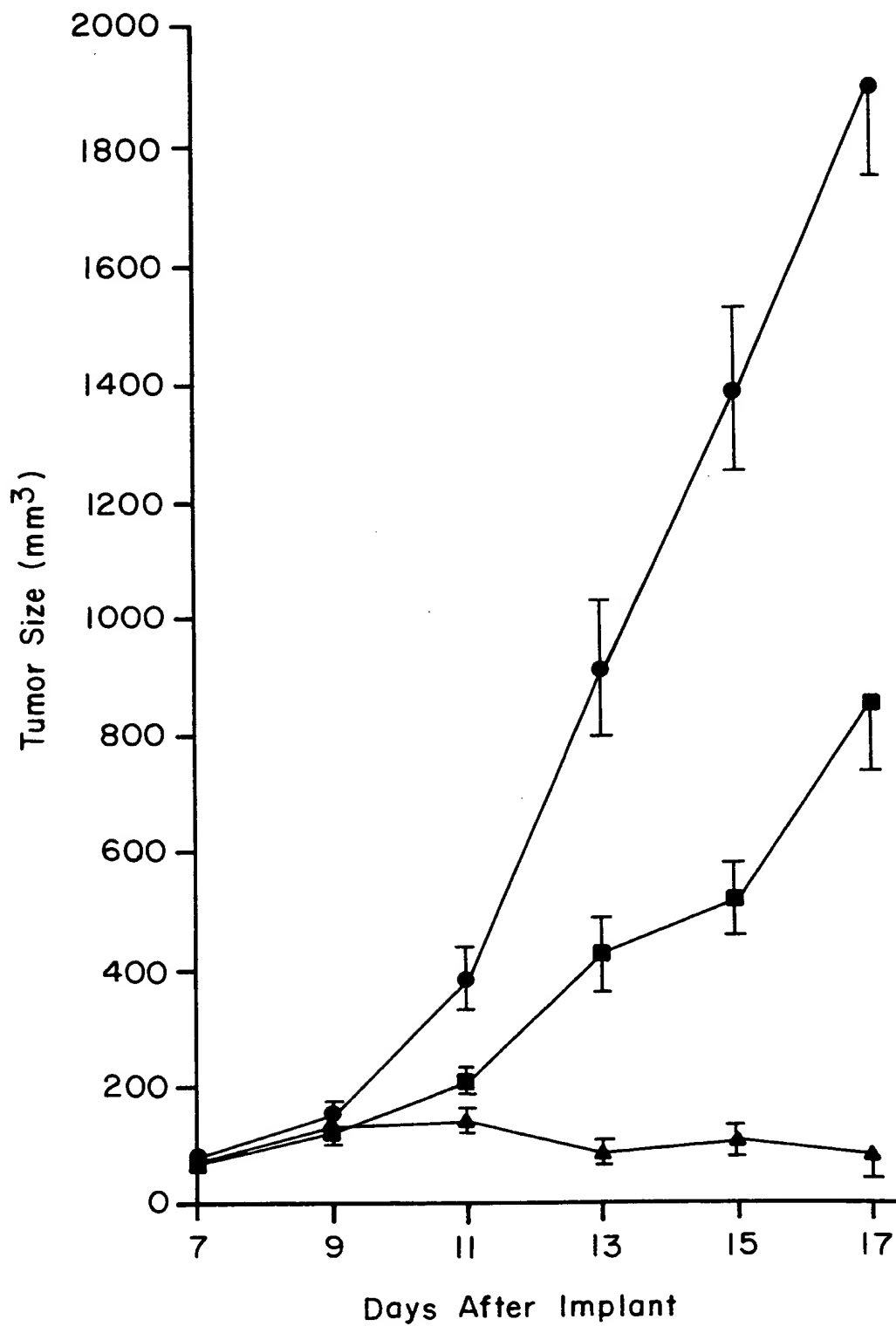
FIG. 44B





68/76

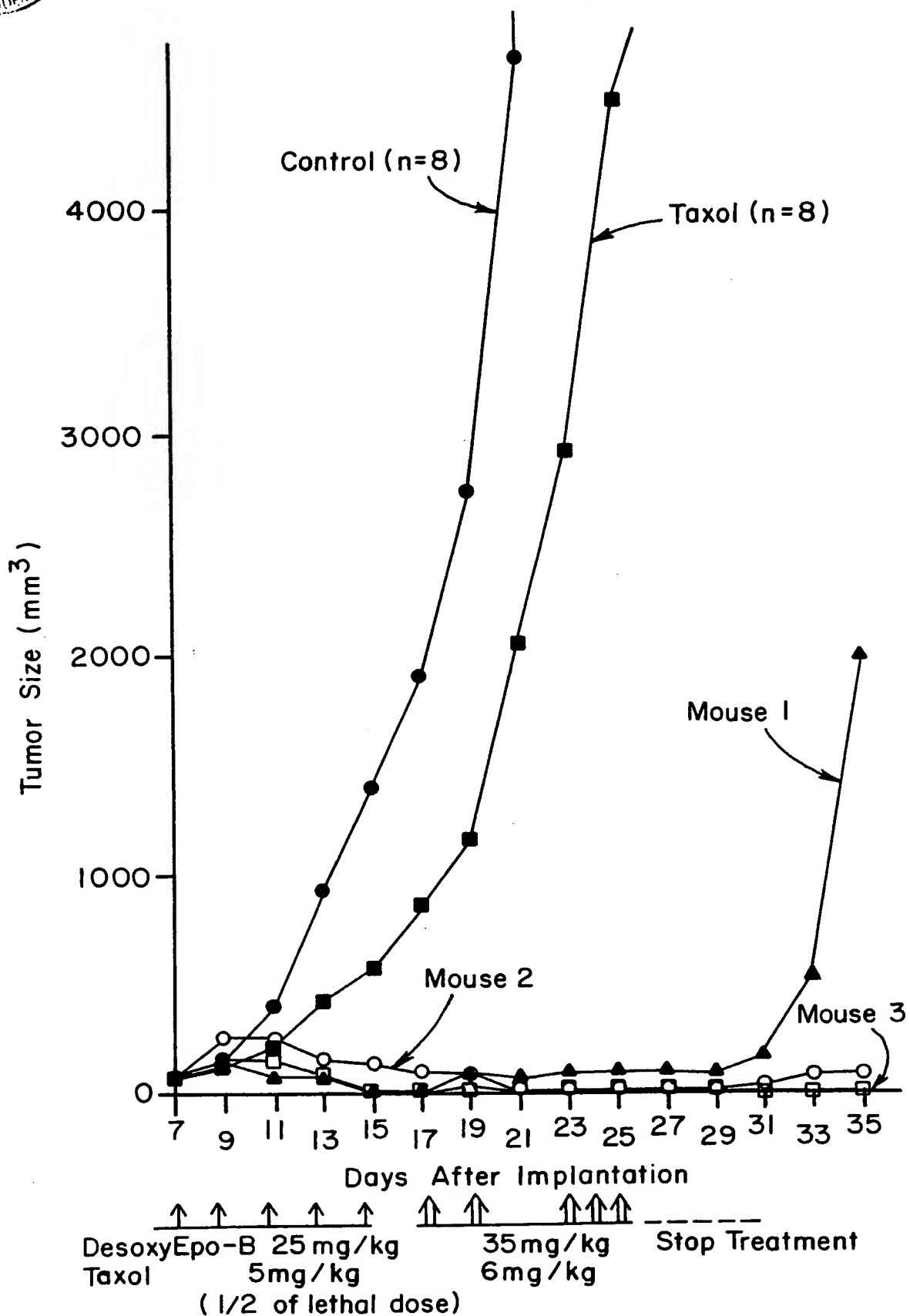
FIG. 45A

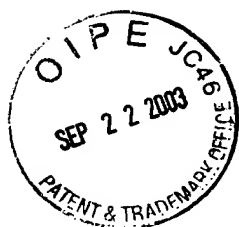




69/76

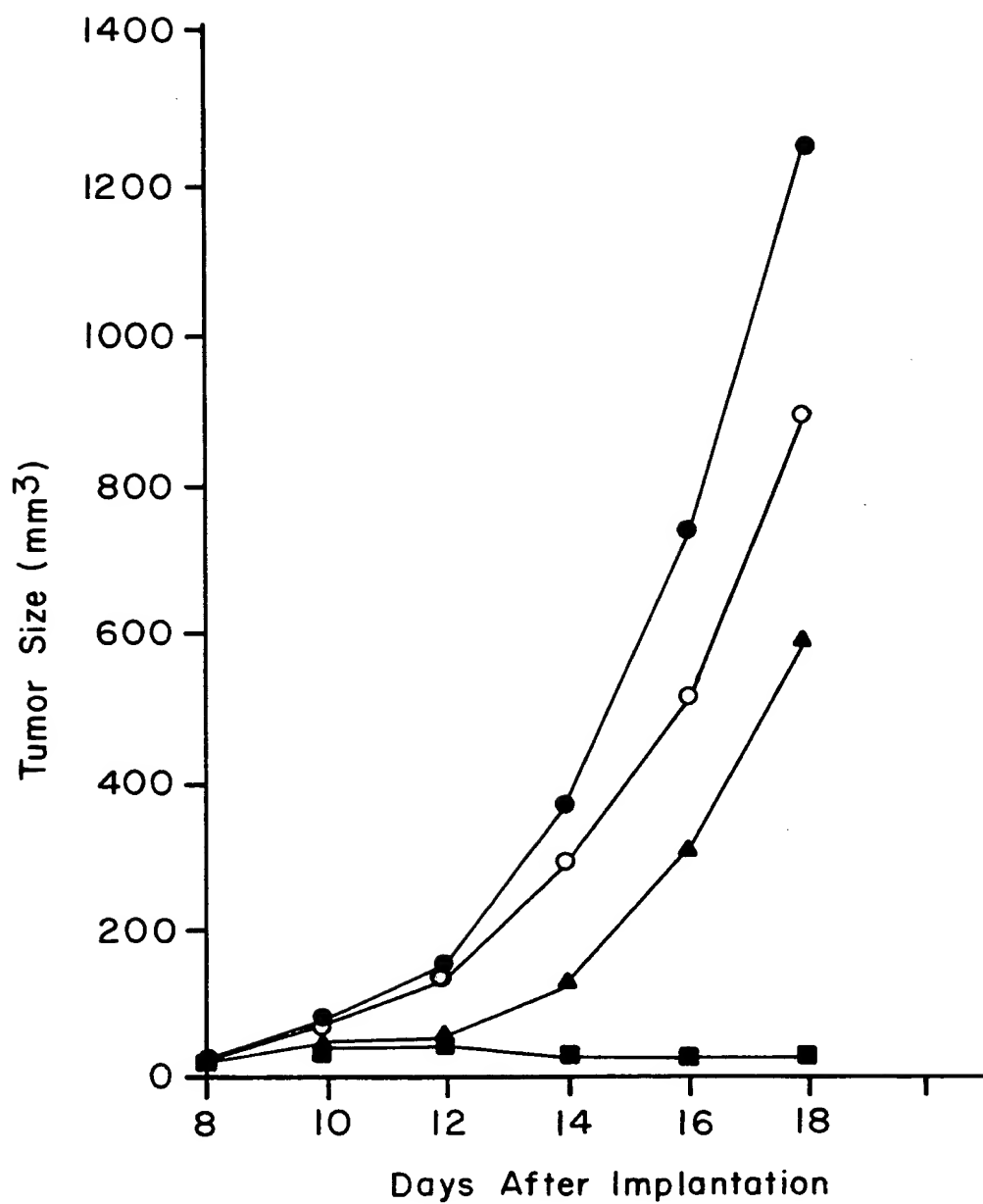
FIG. 45 B





70/76

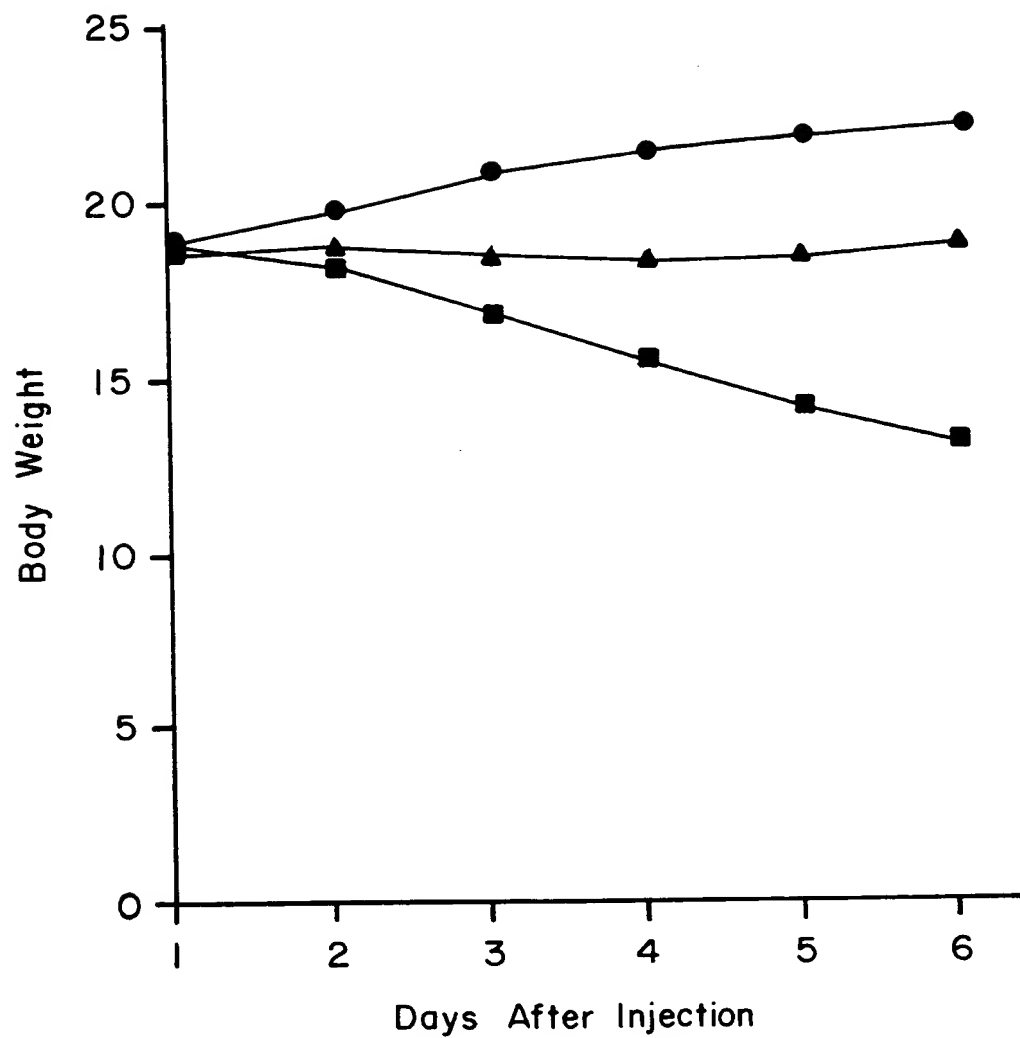
FIG. 46

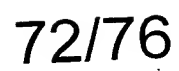




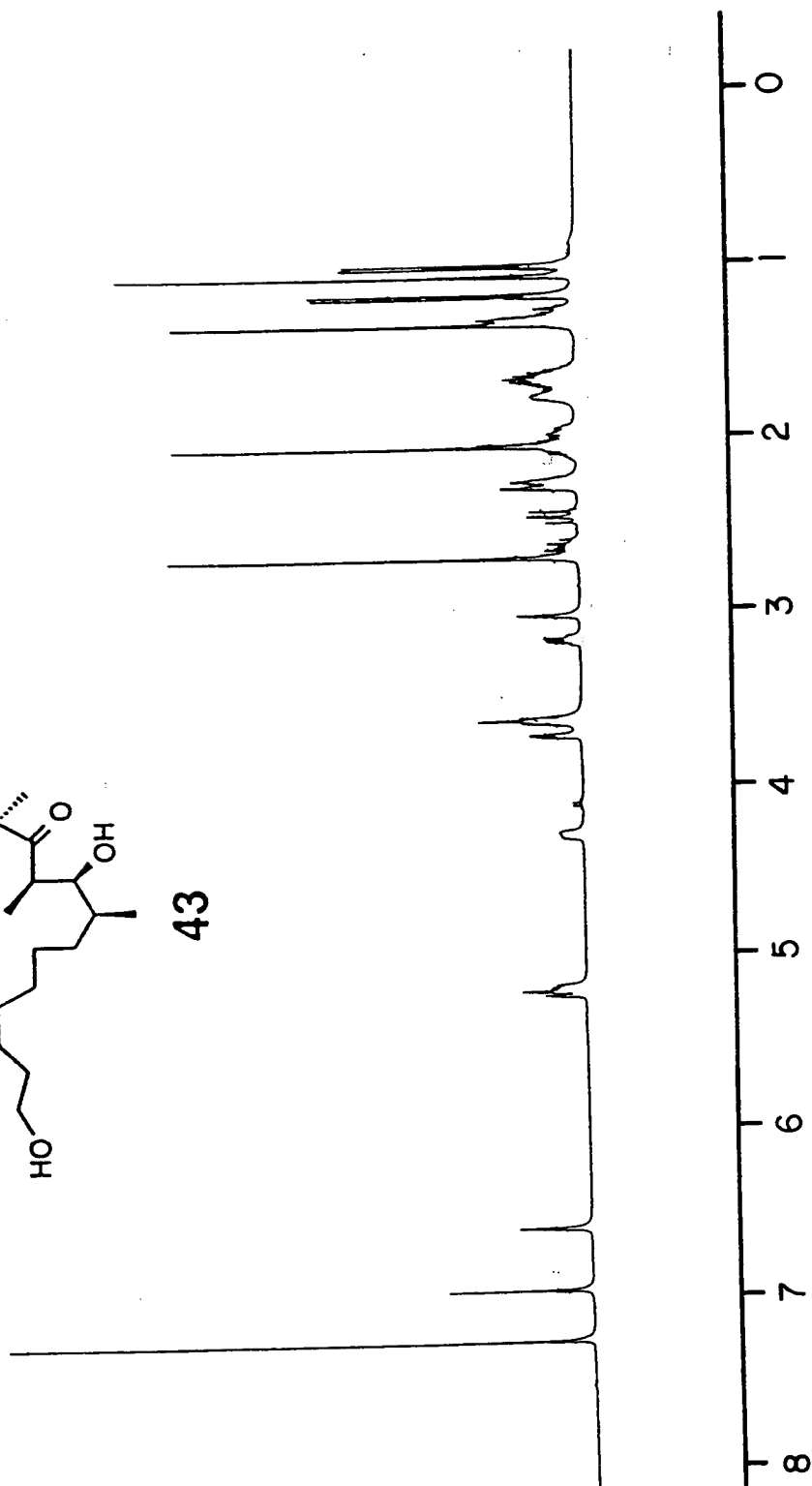
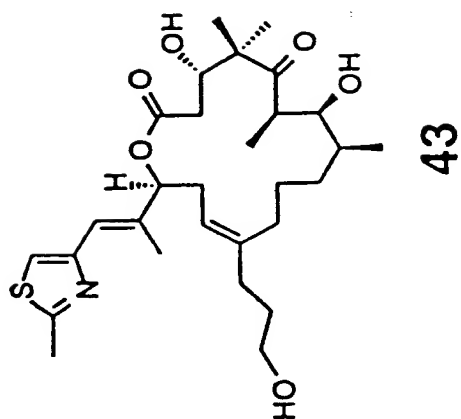
71/76

FIG. 47





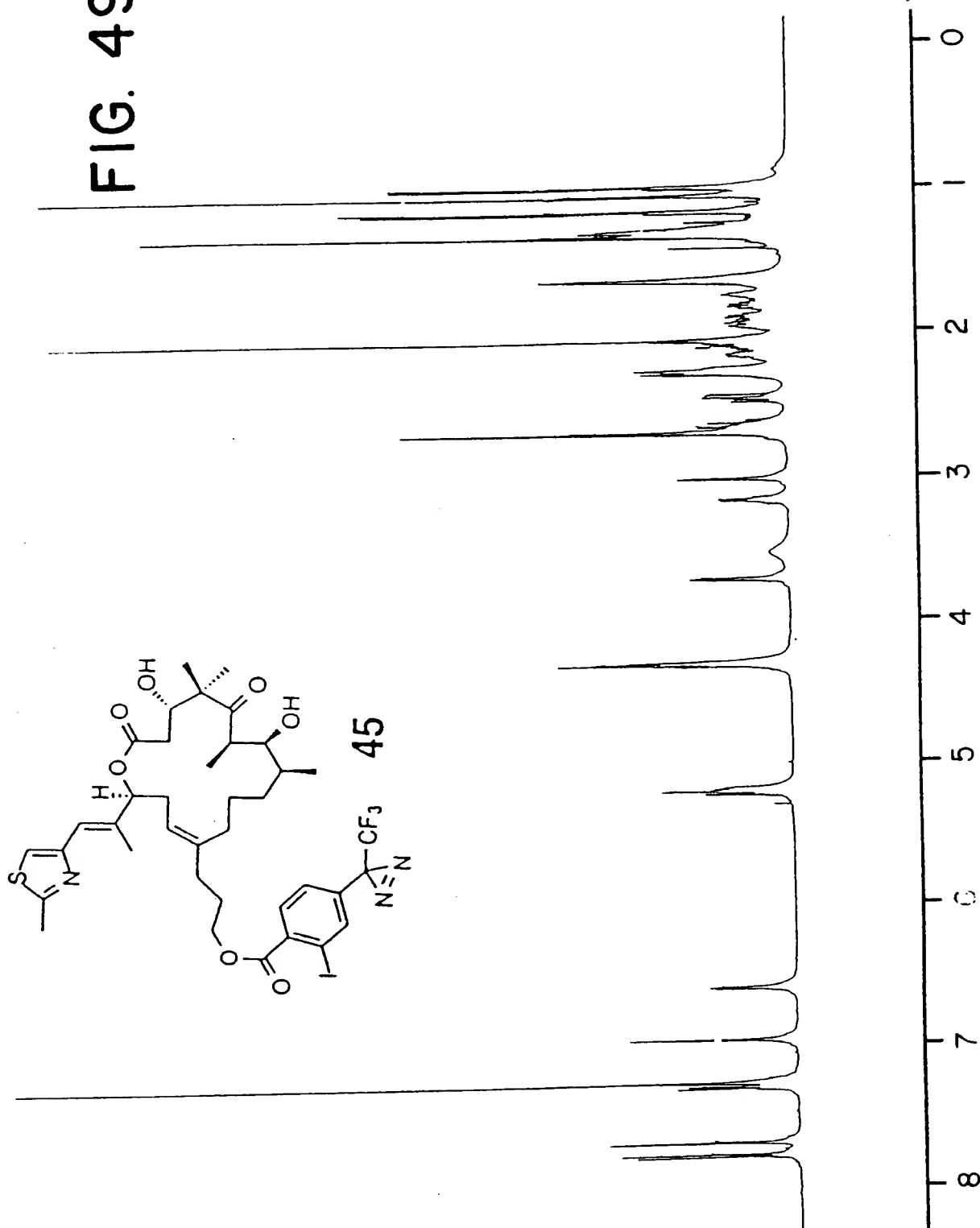
**FIG. 48**





73/76

FIG. 49





74/76

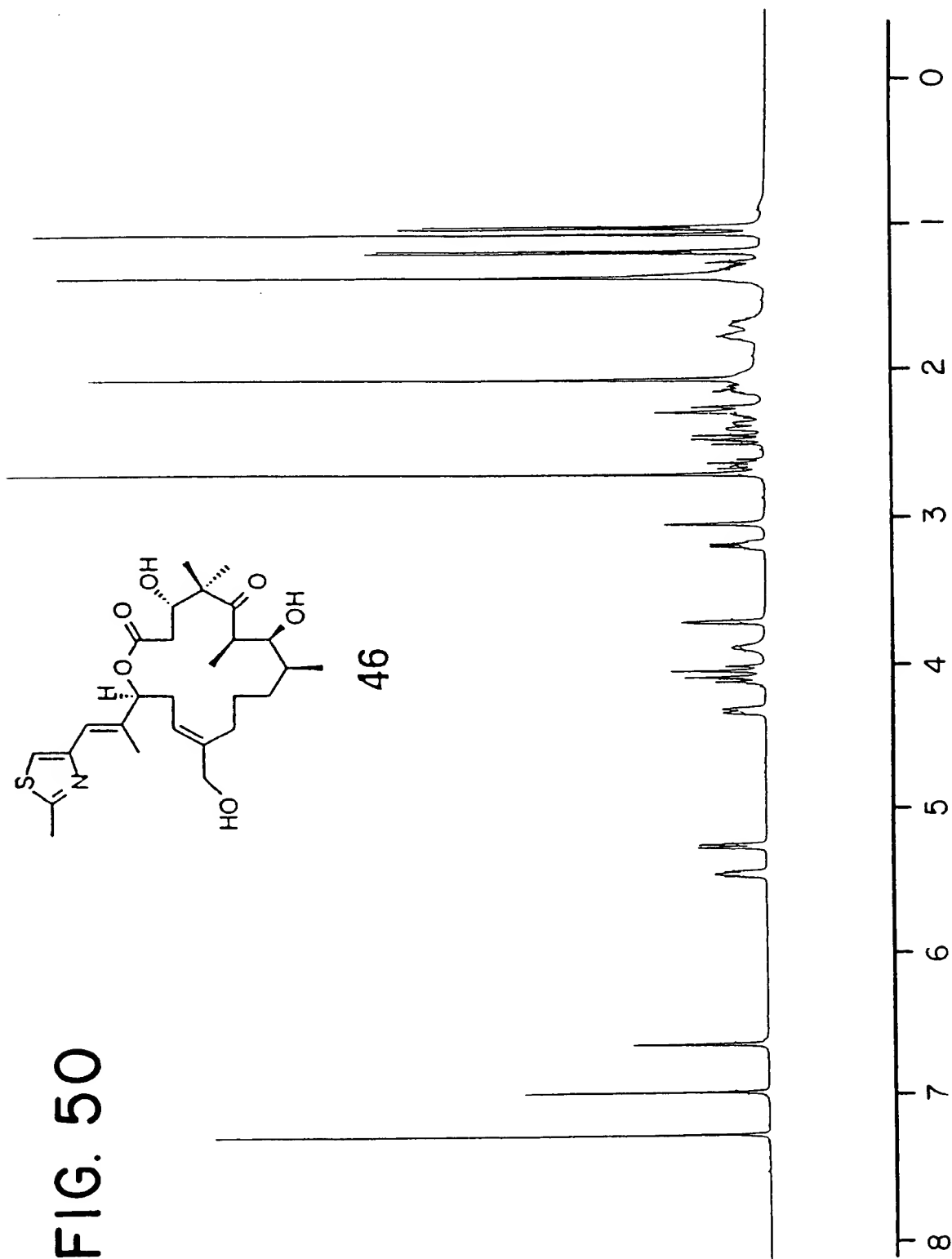
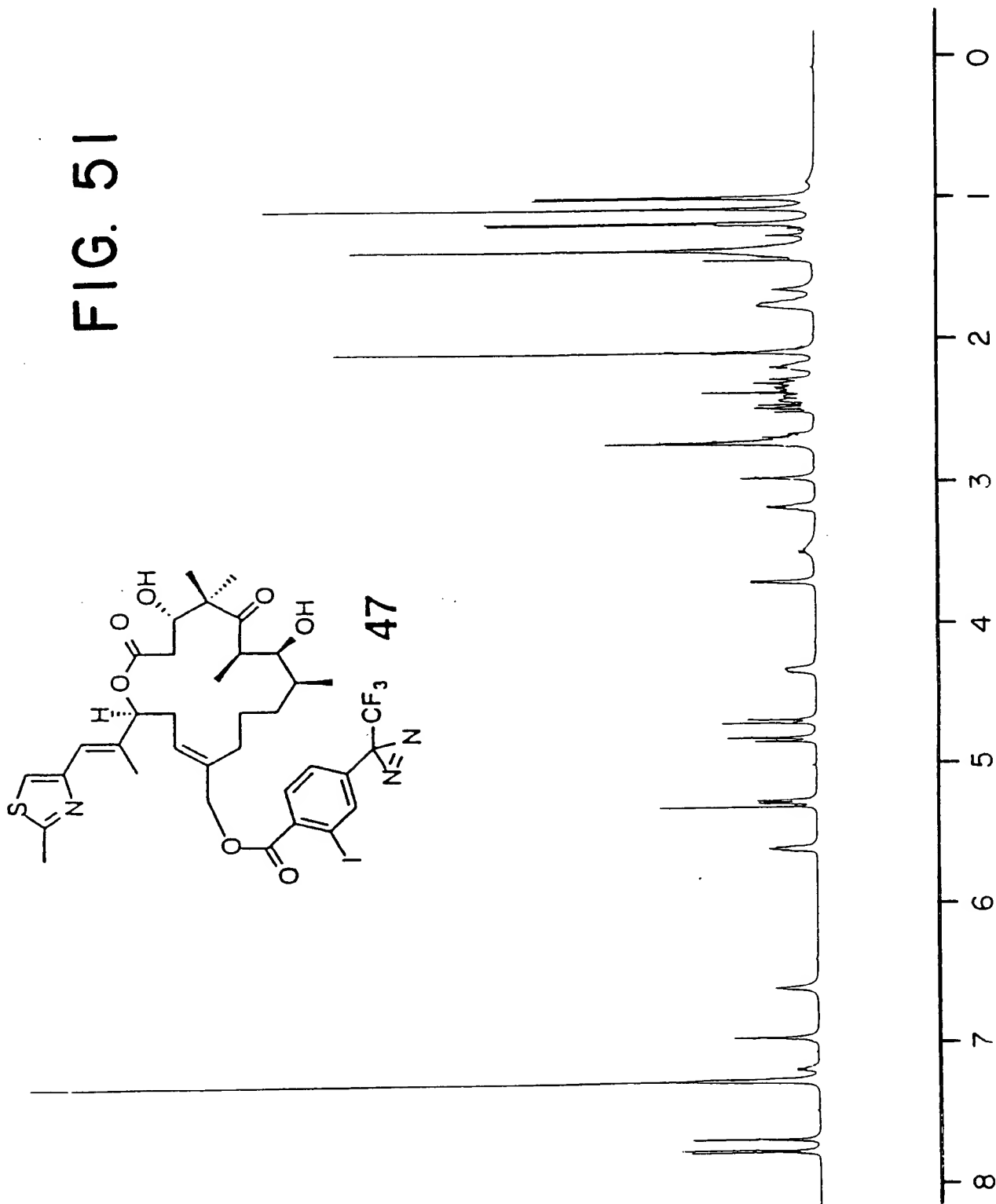


FIG. 50

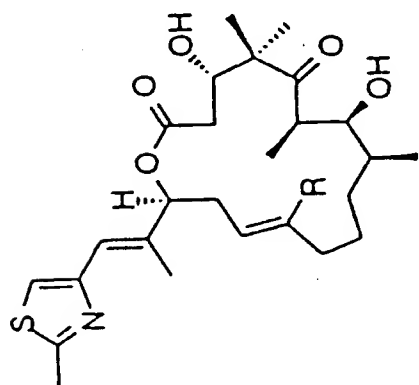
FIG. 15





76/76

FIG. 52



48 R = (CH<sub>2</sub>)<sub>3</sub>OH

